TM 9-4520-271-14

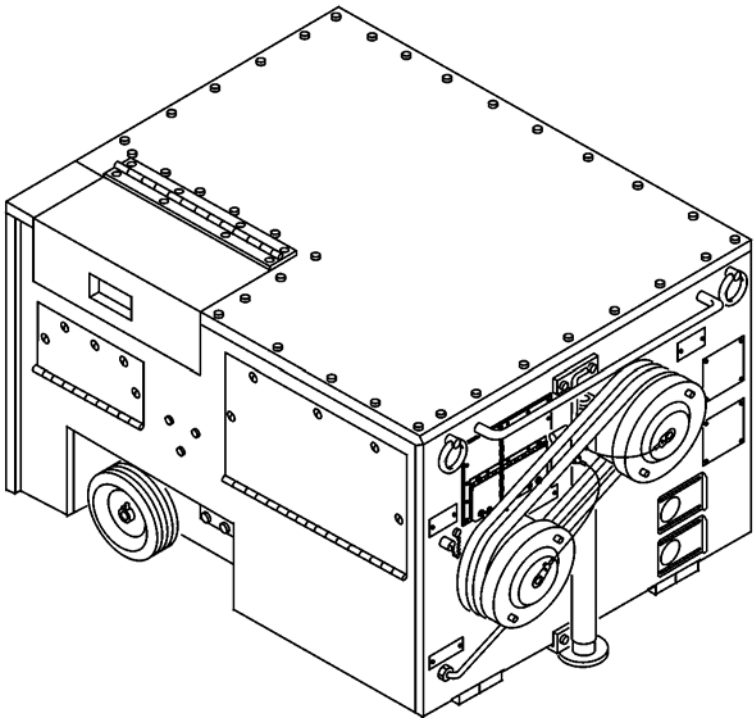
TECHNICAL MANUAL

**OPERATOR'S, UNIT, DIRECT SUPPORT,
AND GENERAL SUPPORT
MAINTENANCE MANUAL**

FOR

IMPROVED ARMY SPACE HEATER (IASH), ELECTRIC POWERED, MULTI-FUEL, 140,000 BTU, MODEL H-140

NSN 4520-01-477-0568 (EIC: IMS)



DISTRIBUTION STATEMENT A – Approved for public release; distribution is unlimited.

HEADQUARTERS, DEPARTMENT OF THE ARMY
15 AUGUST 2005

WARNING SUMMARY

This warning summary contains general safety warnings and hazardous materials warnings that must be understood and applied during operation and maintenance of this equipment. Failure to observe these precautions could result in serious injury or death to personnel.

GENERAL SAFETY WARNINGS

WARNING

CARBON MONOXIDE (EXHAUST GAS)

CARBON MONOXIDE CANNOT BE SEEN OR SMELLED AND CAN KILL YOU. TO PREVENT CARBON MONOXIDE POISONING, THE ARMY SPACE HEATER (ASH) SHOULD BE OPERATED OUTDOORS ONLY.

IF ALARM SOUNDS, IMMEDIATELY MOVE TO FRESH AIR AND SHUT DOWN ASH FROM CONTROL PANEL.

THE BEST DEFENSE AGAINST CARBON MONOXIDE POISONING IS GOOD VENTILATION.

Carbon monoxide is without color or smell but can kill you. Breathing carbon monoxide produces symptoms of headache, dizziness, loss of muscular control, a sleepy feeling, and coma. Brain damage or death can result from heavy exposure. Carbon monoxide occurs in the exhaust fumes of fuel-burning heaters and internal combustion engines. Carbon monoxide can become dangerously concentrated under conditions of no ventilation.

To ensure your safety and that of other maintenance personnel, always observe the following precautions:

OPERATE with the exhaust pipe attached in a well-ventilated area.

DO NOT operate with a known exhaust (combustion air) leak.

BE ALERT at all times during operating procedures for carbon monoxide poisoning. If exposure is present, IMMEDIATELY evacuate personnel to fresh air.

BE AWARE that the field protection mask used for Nuclear, Biological, and Chemical (NBC) attack WILL NOT protect you from carbon monoxide poisoning.

WARNING

COLD METAL

Touching cold metal with exposed skin will cause skin to bond to metal. Gloves are required when touching cold metal objects. Do not touch cold metal parts with bare hands. Frostbite can cause permanent injury.

WARNING SUMMARY – Continued

GENERAL SAFETY WARNINGS – Continued

WARNING

COMPRESSED AIR

FOR FIRST AID INSTRUCTIONS, REFER TO FM 4-25.11, FIRST AID.

When using compressed air for cooling, cleaning, or drying operation, do not exceed 30 psi (207 kPa) at the nozzle. Eyes can be permanently damaged by contact with liquid, and large particles or solvent vapor can damage lungs. When using air for cleaning at an air-exhausted workbench, wear approved goggles or face shield. When using air for cleaning at an unexhausted workbench, wear approved respirator and goggles.

WARNING

ELECTRICAL HIGH VOLTAGE

FOR ARTIFICIAL RESPIRATION, REFER TO FM 4-25.11, FIRST AID.

Electrical high voltage cannot be seen but can kill you. Electricity is unlike most other dangerous things you can come in contact with because it gives no warning and no symptoms to be wary of. Its effect is immediate. It can kill you, render you unconscious, or severely burn you.

To ensure your safety and that of other maintenance personnel, always observe the following precautions:

DO NOT perform any maintenance on electrical equipment unless all power is removed.

BE CERTAIN that there is someone assisting you who can remove power immediately.

WARNING

HOT COMPONENTS

Contact with hot components can cause burns. Allow the ASH to cool down before attempting service, inspection, or maintenance activity.

WARNING

JACK ASSEMBLY

Use care when using the jack assembly or when raising or lowering the wheel assemblies. Fingers or hands may be pinched causing injury to personnel.

WARNING SUMMARY – Continued

GENERAL SAFETY WARNINGS – Continued

WARNING

JEWELRY

Jewelry can catch on equipment and cause injury or may short across an electrical circuit and cause severe burns or electrical shock. Remove rings, bracelets, wristwatches, and neck chains before working around or on the ASH.

WARNING

LIFTING ASH

ASH weighs 360 pounds (163.3 kg). Mechanical lift is required. For localized movement and positioning, lower wheels and manually move ASH to desired location by utilizing handrails.

WARNING

LIFTING WOODEN PACKING CRATE

Wooden packing crate weighs 100 pounds (45.4 kg). Two people are required to lift.

WARNING

NUCLEAR, BIOLOGICAL, AND CHEMICAL (NBC)

If an NBC attack has occurred, do not use Chemical and Biological Protection Kit (CBPK) equipment until all items have been decontaminated. Refer to FM 3-5, NBC Decontamination, for detailed decontamination procedures.

WARNING

OVERHEATING

Heat exchanger overheating may damage the ASH and under some conditions a safety hazard may result. An overheat shutdown occurs when the combustion air and ventilation air fan assemblies are turned off at the same time when in the heating modes. Always set the control panel MODE SWITCH to the VENT position for at least 2 minutes when shutting down the ASH from the heating modes.

WARNING

SHEET METAL

Edges of sheet metal can be sharp and may cause injury to personnel. Gloves are required when handling the heat exchanger assembly.

WARNING SUMMARY – Continued

GENERAL SAFETY WARNINGS – Continued

WARNING

STEEL BANDING

Steel banding cut under tension can snap free and cause injury. Leather gloves and face shield are required.

HAZARDOUS MATERIALS WARNINGS

WARNING

ACRYLIC LACQUER SEALANT

Acrylic lacquer sealant is flammable. Keep away from open flames or other sources of ignition. Avoid breathing fumes from sealant. Good general ventilation is normally adequate. Avoid skin contact with sealant.

WARNING

CLEANING AGENTS

DO NOT use diesel fuel, gasoline, or benzene (benzol) for cleaning.

DO NOT SMOKE when using cleaning solvents. NEVER USE CLEANING SOLVENTS NEAR AN OPEN FLAME. Be sure a fire extinguisher is available. Use cleaning solvents only in well-ventilated areas. The flash point of cleaning solvent is 138°F (60°C).

USE CARE when using cleaning solvents. Cleaning solvents evaporate quickly and can irritate exposed skin if solvents contact skin. In cold weather, contact of exposed skin with cleaning solvents can cause frostbite.

WARNING

CLEANING COMPOUND SOLVENT

Cleaning compound solvent vapors are toxic. Avoid prolonged or repeated breathing of vapors or solvent contact with skin. Use only with adequate ventilation. Solvent is flammable and should not be used near open flame. Be sure a fire extinguisher is available.

HAZARDOUS MATERIALS WARNINGS – Continued

WARNING

FUEL

FOR FUEL SPILLS, REFER TO FM 10-67-1, CONCEPTS AND EQUIPMENT OF PETROLEUM OPERATIONS.

Fuel is flammable and toxic to eyes, skin, and respiratory tract. Skin/eye protection is required. Avoid repeated/prolonged contact. Use only in well-ventilated areas. Keep away from open flames or other sources of ignition. Post FUEL FLAMMABLE/NO SMOKING signs around the area. Be sure a fire extinguisher is available.

Fuel on clothing can be fatal if ignited by a static discharge. If fuel gets on clothes, leave the refueling area as soon as possible, remove clothes, and wash skin with warm, soapy water before getting dressed.

Spilled fuel creates a flammable, vapor-air mixture and fire can take place. Improper positioning of external fuel source can cause fuel tank to overflow. Stop refueling immediately if fuel spill occurs.

WARNING

RUBBER ADHESIVE

Rubber adhesive is flammable. Keep away from open flames or other sources of ignition. Avoid breathing fumes from adhesive. Good general ventilation is normally adequate. Avoid skin contact with adhesive.

WARNING

SOLDER

Avoid breathing fumes generated by soldering. Eye protection is required. Good general ventilation is normally adequate.

TM 9-4520-271-14

CHANGE NO. 1

HEADQUARTERS DEPARTMENT OF THE ARMY WASHINGTON, DC, 15 DECEMBER 2007

TECHNICAL MANUAL

OPERATOR'S, UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT MAINTENANCE MANUAL FOR IMPROVED ARMY SPACE HEATER (IASH), ELECTRIC POWERED, MULTI-FUEL, 140,000 BTU, MODEL H-140 NSN 4520-01-477-0568 (EIC: IMS)

DISTRIBUTION STATEMENT A: - Approved for public release; distribution is unlimited. TM 9-4520-271-14, 15 August 2005, is updated as follows:

1. File this sheet in front of the manual for reference.

2. This change incorporates updated maintenance information, changes the point of contact for EIR or DA form 2028 submittal, updates references, and converts the MAC to the two-level maintenance concept.

3. New or updated text is indicated by a vertical bar in the outer margin of the page. New graphics are indicated by a vertical bar in the outer margin of the page. Changes to graphics will be indicated by a pointing finger icon within the graphic.

4. Remove old pages and insert new pages as indicated below:

Remove Pages	Insert Pages	Remove Pages	Insert Pages
A /(B blank)	A/(B blank)	DA form 2028	DA form 2028
i /(ii blank)	i/(ii blank)	DA form 2028	DA form 2028
Index 7 - Index 8	Index 7 - Index 8	DA form 2028	DA form 2028
Electronic Instructions	Electronic Instructions	DA form 2028	
N/A	Sample 2028		

5. Replace the following work packages with their new revised version:

Work Package No.	Work Package No.
WP 0001 00	WP 0057 00
WP 0030 00	WP 0058 00
WP 0037 00	WP 0059 00
WP 0056 00	

C-1

By Order of the Secretary of the Army:

GEORGE W. CASEY, JR.
General, United States Army
Chief of Staff

Official:

JOYCE E. MORROW
Administrative Assistant to the
Secretary of the Army
0732501

Distribution: To be distributed in accordance with initial distribution number (IDN) 256844 requirements for TM 9-4520-271-14.

INSERT LATEST CHANGED PAGES/WORK PACKAGES. DESTROY SUPERSEDED DATA.

LIST OF EFFECTIVE PAGES/WORK PACKAGES

NOTE: The portion of text affected by the change is indicated by a vertical bar in the outer margins of the page. Changes to illustrations are indicated by a vertical bar adjacent to the title. Zero in the "Change No." column indicates an original page or work package.

Dates of issue for the original manual and changed pages/work packages are:

Original 0 15 August 2005
Change 1 15 December 2007

TOTAL NUMBER OF PAGES FOR FRONT AND REAR MATTER IS 50 AND TOTAL NUMBER OF WORK PACKAGES IS 62, CONSISTING OF THE FOLLOWING:

Page/WP No.	Change No.	Page/WP No.	Change No.
Title	**0**	WP 0031 00 (4 pgs)	**0**
a – e/(f Blank) (6 pgs)	**0**	WP 0032 00 (4 pgs)	**0**
i/(ii blank) (2 pgs)	**1**	WP 0033 00 (6 pgs)	**0**
iii - vi (4 pgs)	**0**	WP 0034 00 (6 pgs)	**0**
WP 0001 00 (4 pgs)	**1**	WP 0035 00 (8 pgs)	**0**
Chp 1 title page	**0**	WP 0036 00 (4 pgs)	**0**
WP 0002 00 (10 pgs)	**0**	WP 0037 00 (10 pgs)	**1**
WP 0003 00 (6 pgs)	**0**	WP 0038 00 (22 pgs)	**0**
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WP 0004 00 (6 pgs)	**0**	WP 0040 00 (4 pgs)	**0**
WP 0005 00 (14 pgs)	**0**	WP 0041 00 (6 pgs)	**0**
WP 0006 00 (2 pgs)	**0**	WP 0042 00 (4 pgs)	**0**
WP 0007 00 (8 pgs)	**0**	WP 0043 00 (4 pgs)	**0**
WP 0008 00 (10 pgs)	**0**	WP 0044 00 (4 pgs)	**0**
Chp 3 title page	**0**	WP 0045 00 (4 pgs)	**0**
WP 0009 00 (2 pgs)	**0**	WP 0046 00 (6 pgs)	**0**
WP 0010 00 (16 pgs)	**0**	WP 0047 00 (54 pgs)	**0**
Chp 4 title page	**0**	WP 0048 00 (4 pgs)	**0**
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Chp 6 title page	**0**	WP 0053 00 (8 pgs)	**0**
WP 0015 00 (12 pgs)	**0**	WP 0054 00 (12 pgs)	**0**
WP 0016 00 (4 pgs)	**0**	WP 0055 00 (6 pgs)	**0**
WP 0017 00 (18 pgs)	**0**	Chp 8 Title page	**0**
WP 0018 00 (2 pgs)	**0**	Chp 9 Title page	**0**
WP 0019 00 (2 pgs)	**0**	WP 0056 00 (2 pgs)	**1**
WP 0020 00 (4 pgs)	**0**	WP 0057 00 (4 pgs)	**1**
WP 0021 00 (4 pgs)	**0**	WP 0058 00 (6 pgs)	**1**
WP 0022 00 (10 pgs)	**0**	WP 0059 00 (6 pgs)	**1**
WP 0023 00 (4 pgs)	**0**	WP 0060 00 (2 pgs)	**0**
WP 0024 00 (4 pgs)	**0**	WP 0061 00 (4 pgs)	**0**
WP 0025 00 (2 pgs)	**0**	WP 0062 00 (4 pgs)	**0**
WP 0026 00 (30 pgs)	**0**	Index-1 - Index-7	**0**
WP 0027 00 (4 pgs)	**0**	Index 8	**1**
WP 0028 00 (6 pgs)	**0**	Index 9 - Index 20	**0**
WP 0029 00 (8 pgs)	**0**	FP-1/(FP-2 Blank) (2 pgs)	**0**
WP 0030 00 (14 pgs)	**1**	FP-3/(FP-4 Blank) (2 pgs)	**0**

HEADQUARTERS,
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., 15 AUGUST 2005

TECHNICAL MANUAL

OPERATOR'S, UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT MAINTENANCE MANUAL

FOR

IMPROVED ARMY SPACE HEATER (IASH), ELECTRIC POWERED, MULTI-FUEL, 140,000 BTU, MODEL H-140

NSN 4520-01-477-0568 (EIC: IMS)

REPORTING ERRORS AND RECOMMENDING IMPROVEMENTS

You can help improve this manual. If you find any mistakes or if you know of a way to improve the procedures, please let us know. Mail your letter or DA Form 2028 (Recommended Changes to Publications and Blank Forms), directly to: Commander, US Army TACOM Life Cycle Management Command, ATTN: AMSTA-LC-SECT, Natick, MA 01760. You may also send in your recommended changes via electronic mail or by fax. Our fax number is DSN 256-5205 or commercial 508-233-5205. Our e-mail address is soldier.pubs@us.army.mil A reply will be furnished to you.

DISTRIBUTION STATEMENT A – Approved for public release; distribution is unlimited.

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INDEX Index-1

HOW TO USE THIS MANUAL

This manual contains operator, unit, direct support, and general support operation and maintenance instructions for the Army Space Heater (ASH), model H-140.

The table of contents at the front of the manual and the chapter indexes will help you understand the organization of the manual and will direct you to the major sections. The index at the rear of the manual will direct you to more detailed segments.

The Illustrated List of Manufactured Items work package (WP 0047 00) provides parts to be fabricated to perform maintenance.

The References work package (WP 0056 00) provides a listing of other related publications.

The Maintenance Allocation Chart work package (WP 0058 00) provides tools and test equipment to perform maintenance.

The Expendable and Durable Items List work package (WP 0061 00) provides supplies to perform maintenance.

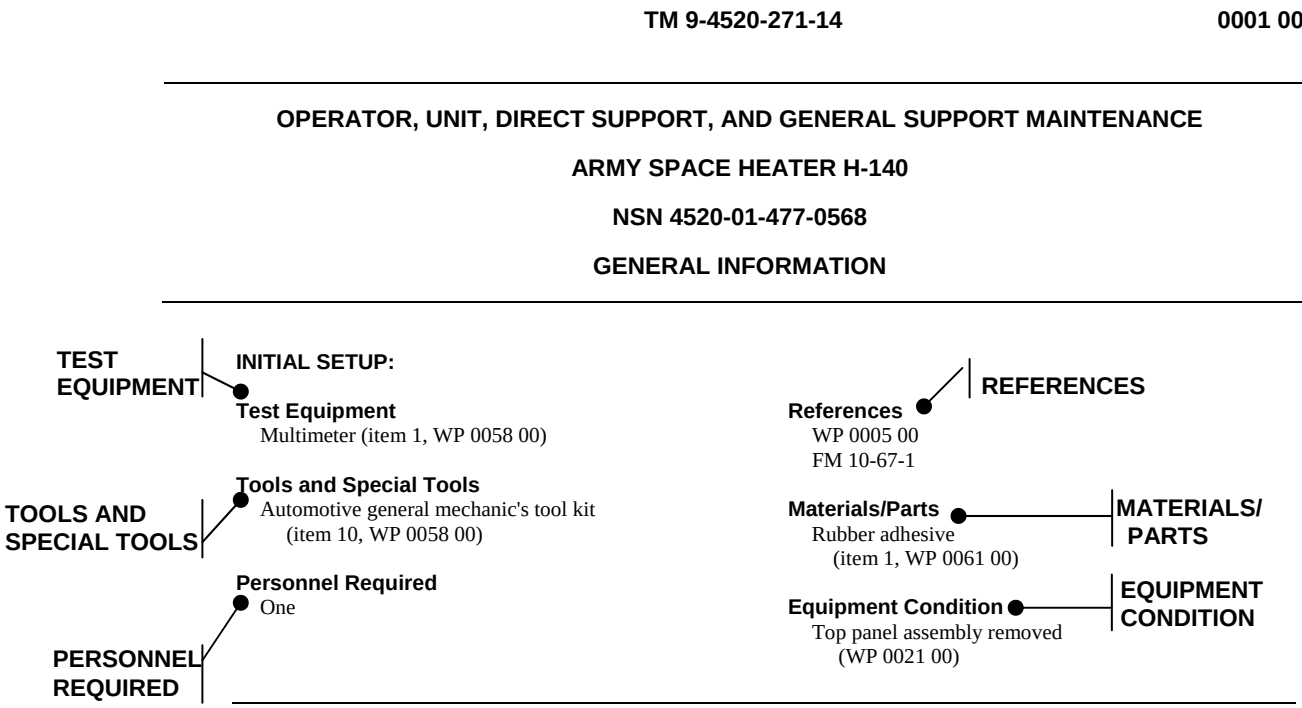
The Mandatory Replacement Parts work package (WP 0062 00) provides parts to perform maintenance.

The ASH Repair Parts and Special Tools List (RPSTL) manual, TM 9-4520-271-24P, lists and authorizes spares, repair parts, and special tools required for performance of maintenance.

While performing the procedures in this manual, you may find that you are able to make suggestions that will improve the manual. At the back of this manual, you will find copies of DA Form 2028 which invite you to submit your suggestions.

HOW TO USE THIS MANUAL – Continued

Before you start any maintenance procedure, read the INITIAL SETUP carefully. Get the test equipment, tools, supplies, and parts listed and the personnel needed.



LEGEND:

TEST EQUIPMENT	The test equipment needed to do the procedures.
TOOLS AND SPECIAL TOOLS	The tools and equipment needed to do the procedures.
PERSONNEL REQUIRED	The personnel needed to do the procedures.
REFERENCES	Other work packages, manuals, and publications needed to do the procedures.
MATERIALS/PARTS	The supplies and parts needed to do the procedures.
EQUIPMENT CONDITION	The procedures to be performed before doing maintenance.

OPERATOR'S, UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT MAINTENANCE
IMPROVED ARMY SPACE HEATER H-140
NSN 4520-01-477-0568
GENERAL INFORMATION

SCOPE

This Technical Manual (TM) contains instructions for operator, unit, direct support, and general support checks and adjustments, theory of operation, troubleshooting, and corrective maintenance for the Improved Army Space Heater (IASH) also referred to in this manual as the Army Space Heater (ASH). For the purposes of this manual, the two terms are interchangeable and the term ASH will be updated to reflect IASH in future technical manual changes or revisions.

Type of Manual: Operator's, Unit, Direct Support, and General Support Maintenance Manual.

Model Number and Equipment Name: Improved Army Space Heater (IASH), Electric Powered, Multi-fuel, 140,000 BTU, Model H-140.

Purpose of Equipment: The IASH is designed for heating and ventilating fixed and transportable shelters.

CONSOLIDATED INDEX OF ARMY PUBLICATIONS AND BLANK FORMS

Refer to the latest issue of DA PAM 25-30 to determine whether there are new editions, changes, or additional publications pertaining to the equipment.

MAINTENANCE FORMS, RECORDS, AND REPORTS

1. Department of the Army forms and procedures used for equipment maintenance will be those prescribed by DA PAM 750-8, The Army Maintenance Management System (TAMMS) Users Manual.

2. Reporting of Item and Packaging Discrepancies. Fill out and forward SF 364 (Report of Discrepancy (ROD)) as prescribed in AR 735-11-2 (Reporting of Supply Discrepancies)/DLAR 4140.55/SECNAVINST 4355.18/AFR 400-54/MCO 4430.3J.

DESTRUCTION OF ARMY MATERIEL TO PREVENT ENEMY USE

Instructions for destruction of the equipment to prevent enemy use are in TM 750-244-3.

ADMINISTRATIVE STORAGE

Administrative storage of equipment issued to and used by Army activities will have Preventive Maintenance Checks and Services (PMCS) performed before storing. When removing the equipment from administrative storage, the PMCS checks should be performed to ensure operational readiness.

REPORTING EQUIPMENT IMPROVEMENT RECOMMENDATIONS (EIR)

If your IASH needs improvement, let us know. Send us an EIR. You, the user, are the only one who can tell us what you don't like about your equipment. Let us know why you don't like the design or performance. Put it on an SF 368 (Product Quality Deficiency Report). Mail it to us at: Commander, U.S. Army TACOM Life Cycle Management Command, ATTN: AMSTA-LC-SECT, Natick, MA 01760. You may also send in your recommended changes via electronic mail or by fax. Our fax number is DSN 256-5205 or commercial 508-233-5205. Our e-mail address is soldier.pubs@us.army.mil. We will send you a reply.

CORROSION PREVENTION AND CONTROL (CPC)

CPC of Army materiel is a continuing concern. It is important that any corrosion problems with this item be reported so that the problem can be corrected and improvements made to prevent the problem in future items.

While corrosion is typically associated with rusting of metals, it can also include deterioration of other materials, such as rubber and plastic. Unusual cracking, softening, swelling, or breaking of these materials may be a corrosion problem.

If a corrosion problem is identified, it can be reported using SF 368, Product Quality Deficiency Report. Use of key words such as "corrosion", "rust", "deterioration", or "cracking" will ensure that the information is identified as a CPC problem.

The form should be submitted to the address specified in DA PAM 750-8, The Army Maintenance Management System (TAMMS) Users Manual.

PREPARATION FOR STORAGE OR SHIPMENT

Refer to the Preparation for Storage or Shipment work package (WP 0046 00) which also includes packaging and administrative storage information.

WARRANTY INFORMATION

The IASH is warranted for 60 months from the date of acceptance for the end item, IASH.

LIST OF ABBREVIATIONS/ACRONYMS

Abbreviation/Acronym	Name
AAL	Additional Authorization List
ASH	Army Space Heater
BE	Bale
BII	Basic Issue Items List
CAGEC	Commercial and Government Entity Code
CARC	Chemical agent resistant coating
CBPK	Chemical and biological protection kit
CN	Can
CO	Carbon monoxide
COEI	Component of End Item List
COM	Common
CPC	Corrosion prevention and control

LIST OF ABBREVIATIONS/ACRONYMS – CONTINUED

Abbreviation/Acronym	Name
CTA	Common Table of Allowances
EIR	Equipment Improvement Recommendations
FGC	Functional group code
GAA	Grease, automotive and artillery
HD	Hundred
IASH	Improved Army Space Heater
ILLUS	Illustration
JTA	Joint Table of Allowances
KT	Kit
MAC	Maintenance Allocation Chart
MTOE	Modified Tables of Organization and Equipment
MWO	Maintenance Work Order
N.O.	Normally open
NBC	Nuclear, biological, and chemical
NSN	National stock number
PL	Pail
PL	Place
PMCS	Preventive maintenance checks and services
RECM	Recommended
RL	Roll
ROD	Report of Discrepancy
RPSTL	Repair Parts and Special Tools List
RQR	Required
SMR	Source, maintenance, and recoverability
SRA	Specialized Repair Activity
TAMMS	The Army Maintenance Management System
TDA	Tables of Distribution and Allowances
TMDE	Test, Measurement, and Diagnostic Equipment
TU	Tube
U/M	Unit of Measure

QUALITY OF MATERIAL

Material used for replacement, repair, or modification must meet the requirements of this manual. If quality of material requirements are not stated in this manual, the material must meet the requirements of the drawings, standards, specifications, or approved engineering change proposals applicable to the subject equipment.

SAFETY, CARE, AND HANDLING

Read the warning summary in the front of the manual.

Personnel must remove all items of jewelry (rings, bracelets, wristwatches, and neck chains) and loose clothing before working on equipment. Jewelry may short across an electrical circuit and cause severe burns or electrical shock and loose fitting clothing can get caught in moving equipment.

When performing IASH maintenance, keep in mind the purpose of the equipment is to heat and ventilate fixed and transportable shelters. Cleaning fluids, lubricants, preservatives, paint, or other chemicals must not be allowed to contaminate the interior of the IASH.

Operate the equipment after performing maintenance to ensure that repairs have been performed correctly and equipment can be returned to service.

COMMON TOOLS AND EQUIPMENT

For authorized common tools and equipment, refer to the Modified Tables of Organization and Equipment (MTOE), CTA 50-970, Expendable/Durable Items (Except: Medical, Class V, Repair Parts, and Heraldic Items), or CTA 8-100, Army Medical Department Expendable/Durable Items, as applicable to your unit.

SPECIAL TOOLS; TEST, MEASUREMENT, AND DIAGNOSTIC EQUIPMENT (TMDE); AND SUPPORT EQUIPMENT

No special tools are required. Refer to the Maintenance Allocation Chart (MAC) work package (WP 0058 00) for maintenance tasks, TMDE, and support equipment. Refer to the Illustrated List of Manufactured Items work package (WP 0047 00) for parts that are to be fabricated.

REPAIR PARTS

Repair parts are listed and illustrated in the IASH Repair Parts and Special Tools List (RPSTL) manual, TM 9-4520-271-24P.

END OF WORK PACKAGE

CHAPTER 1

DESCRIPTION AND THEORY OF OPERATION FOR ARMY SPACE HEATER H-140

DESCRIPTION AND THEORY OF OPERATION

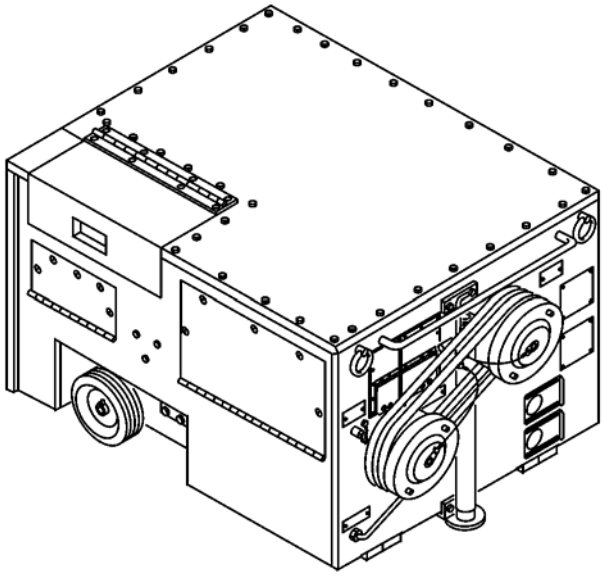
ARMY SPACE HEATER H-140

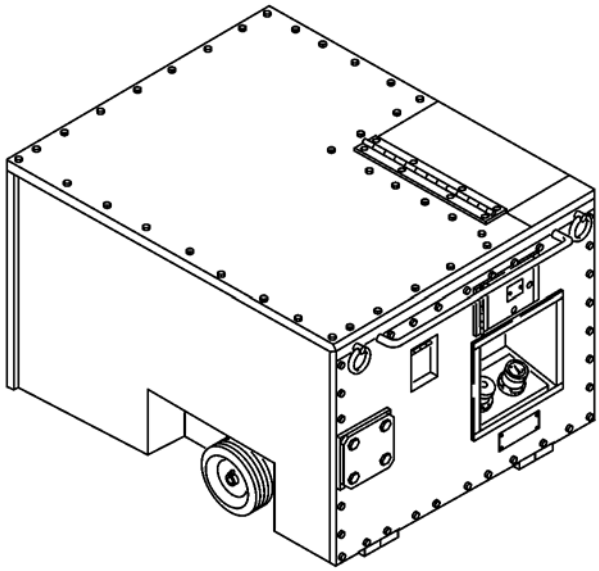
NSN 4520-01-477-0568

EQUIPMENT DESCRIPTION AND DATA

EQUIPMENT CHARACTERISTICS, CAPABILITIES, AND FEATURES

The ASH is a portable unit that can be used as a heater or fresh air ventilator for shelters, vans, and other enclosed areas. In the heating modes, the ASH can operate as either an air recirculator or fresh air heater. The ASH is rated at 140, 000 BTU per hour and can operate up to 8 hours unattended on a 14 gallon (53L) internal fuel tank. Operation can be extended beyond 8 hours when used in the external fuel supply mode. The ASH operates as a heater in an ambient temperature range of –60°F to +100°F (–51°C to +38°C) and operates as a ventilator up to 100°F (38°C). The ASH operates from a 120 Vac, 50/60 Hz, single phase power source, provides quiet operation (less than 60 dBa) for use in areas where personnel work or sleep, has a positive pressurized enclosure, and incorporates an adjustable fresh air damper assembly. The ASH includes a remote control box, retractable wheels, and skids for mobility on ice and snow. Safety features include automatic shutdown in the event of an overtemperature condition or if the ASH detects carbon monoxide gas in the shelter or return airflow. One person can move the ASH when the wheels are extended. The ASH is also suitable for hardening for use in Nuclear, Biological, and Chemical (NBC) environments (WP 0007 00).





LOCATION AND DESCRIPTION OF MAJOR COMPONENTS

FRONT AND RIGHT SIDE COMPONENTS

Supply Air Hose Assembly

The supply air hose assembly (1) moves hot air from the ASH to the shelter.

Supply Duct

The supply duct (2) provides support to attach the supply air hose assembly.

Return Air Hose Assembly

The return air hose assembly (3) brings return air back to the ASH for reheating.

Return Duct

The return duct (4) provides support to attach the return air hose assembly.

Fresh Air Damper Assembly

The fresh air damper assembly (5) when open allows fresh air to be drawn into the ASH and can be used in the ventilating mode or heating modes.

Supply and Return Duct Cover Assemblies

The supply and return duct cover assemblies (6) prevent dust and debris from entering the ASH when not in operation or when in storage.

Power Cable Assembly

The power cable assembly (7) provides connection to a power source to operate the ASH.

Remote Control Box Receptacle

The remote control box receptacle (8) provides a receptacle for attaching the remote control box cable.

Remote Control Box

The remote control box (9) allow operation of the ASH from inside the heated area.

Lubrication Chart Information Plate

The lubrication chart information plate (10) provides information for proper lubrication of the ASH.

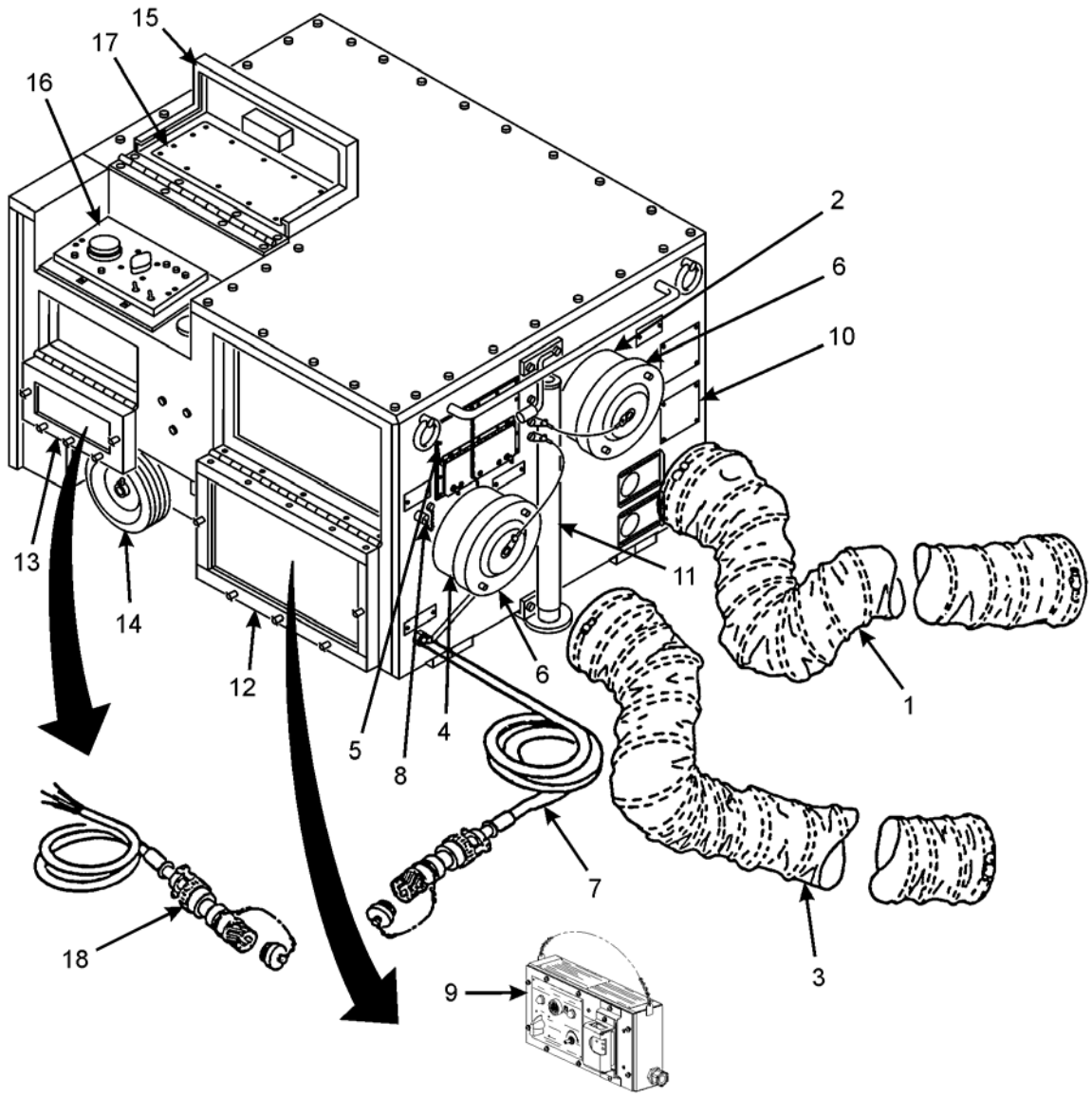
Jack Assembly

The jack assembly (11) is used to raise the ASH to allow the wheels to be extended or retracted and to level the ASH.

Side Front Door Assembly

The side front door assembly (12) provides access to the ASH interior for inspection/maintenance and to the handbook compartment, exhaust elbow, and remote control box.

FRONT AND RIGHT SIDE COMPONENTS – Continued



Side Rear Door Assembly

The side rear door assembly (13) provides access to the ASH interior for inspection/maintenance and to the fuel hose and power cable adapter.

Wheel Assembly (Right Side)

The wheel assembly (14) allows for movement and positioning of the ASH when used in conjunction with the left side wheel assembly.

Control Box Cover Assembly

The control box cover assembly (15) protects the control panel assembly.

FRONT AND RIGHT SIDE COMPONENTS – Continued

Control Panel Assembly

The control panel assembly (16) contains the operator controls and indicators used during operation. The hinged panel provides a central location for troubleshooting the ASH electrical components/controls.

Instruction Plate

The instruction plate (17) shows the electrical and fuel schematics and provides instructions for operating the ASH.

Power Cable Adapter

The power cable adapter (18) adapts the ASH power cable assembly to a 120 Vac, single-phase, screw terminal supply.

REAR AND LEFT SIDE COMPONENTS

Exhaust Pipe

The exhaust pipe (1) removes exhaust gases from the ASH.

Exhaust Pipe Stowage Compartment

The exhaust pipe is stored in the exhaust pipe stowage compartment (2) when the ASH is being shipped or when not in use.

Exhaust Cover Plate

The exhaust cover plate (3) covers the ASH exhaust port when shipped or when in storage. The exhaust cover plate is stowed in the exhaust elbow stowage position when the elbow is attached to the exhaust port.

Sight Glass

The sight glass (4) is used to look into the burner assembly/heat exchanger assembly compartment to ensure that ignition is on and the burner flame is functioning properly.

Wheel Assembly (Left Side)

The wheel assembly (5) allows for movement and positioning of the ASH when used in conjunction with the right side wheel assembly.

Exhaust Elbow

The exhaust elbow (6) when attached to the exhaust port at the rear of the ASH directs exhaust fumes upward into the exhaust pipe.

External Fuel Connection

The external fuel connection (7) is a quick-disconnect and is used to connect the external fuel hose to the ASH. When not in use, a removable cap protects the external fuel connection.

Fuel Selector Valve

The fuel selector valve (8) allows for selection of an external fuel source or the ASH's internal fuel tank.

Fuel Tank Cap

The fuel tank cap (9) prevents dirt and debris from entering the internal fuel tank. The cap is removable for filing the internal fuel tank.

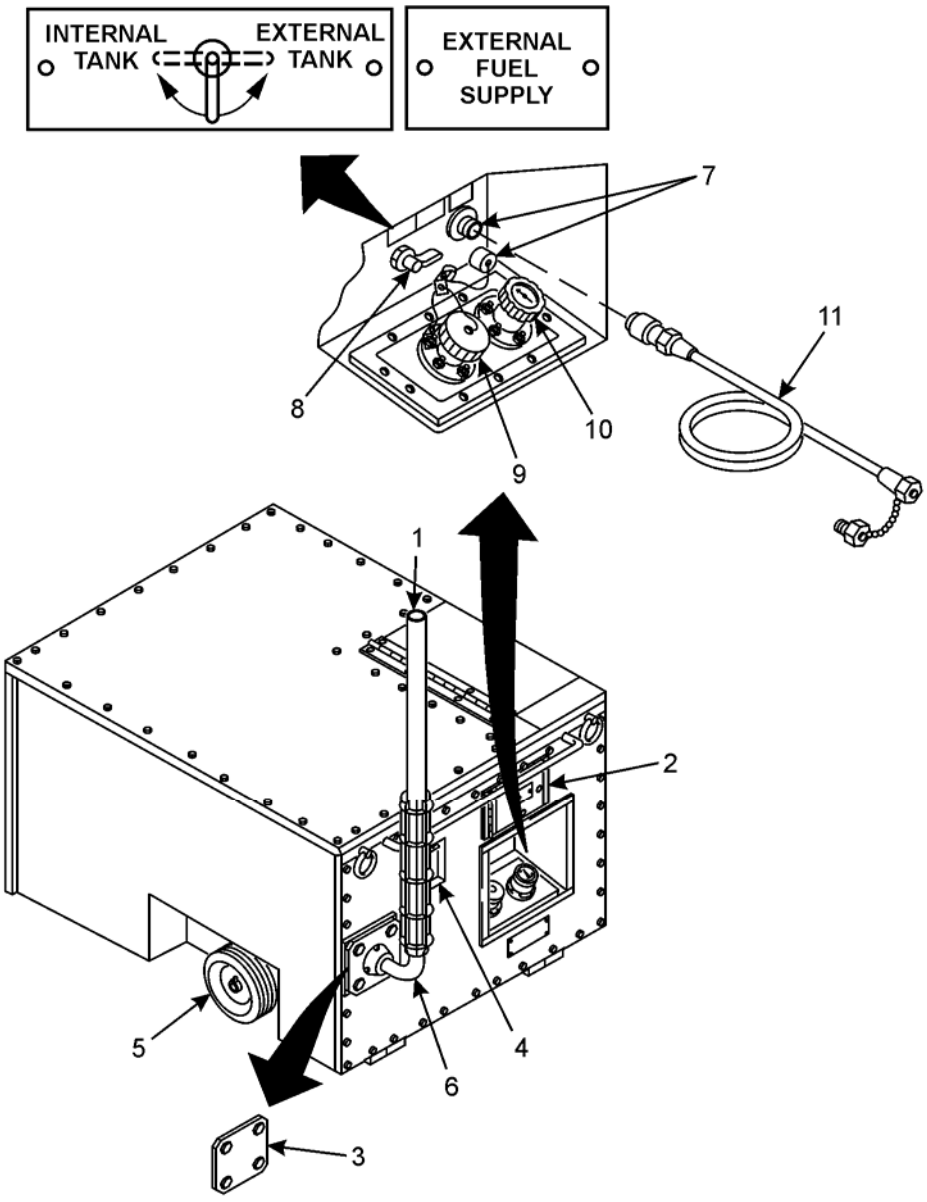
REAR AND LEFT SIDE COMPONENTS – Continued

Fuel Gage

The fuel gage (10) indicates the amount of fuel remaining in the internal fuel tank.

External Fuel Hose

The external fuel hose (11) connects to the ASH's external fuel connector and an external fuel source.



INTERIOR COMPONENTS

Ventilation Air Fan

The ventilation air fan (1) is a “squirrel cage” type fan and provides ventilation air supply.

Ventilation Air Fan Motor

The ventilation air fan motor (2) drives the ventilation air fan assembly and fuel pump.

Fuel Pump

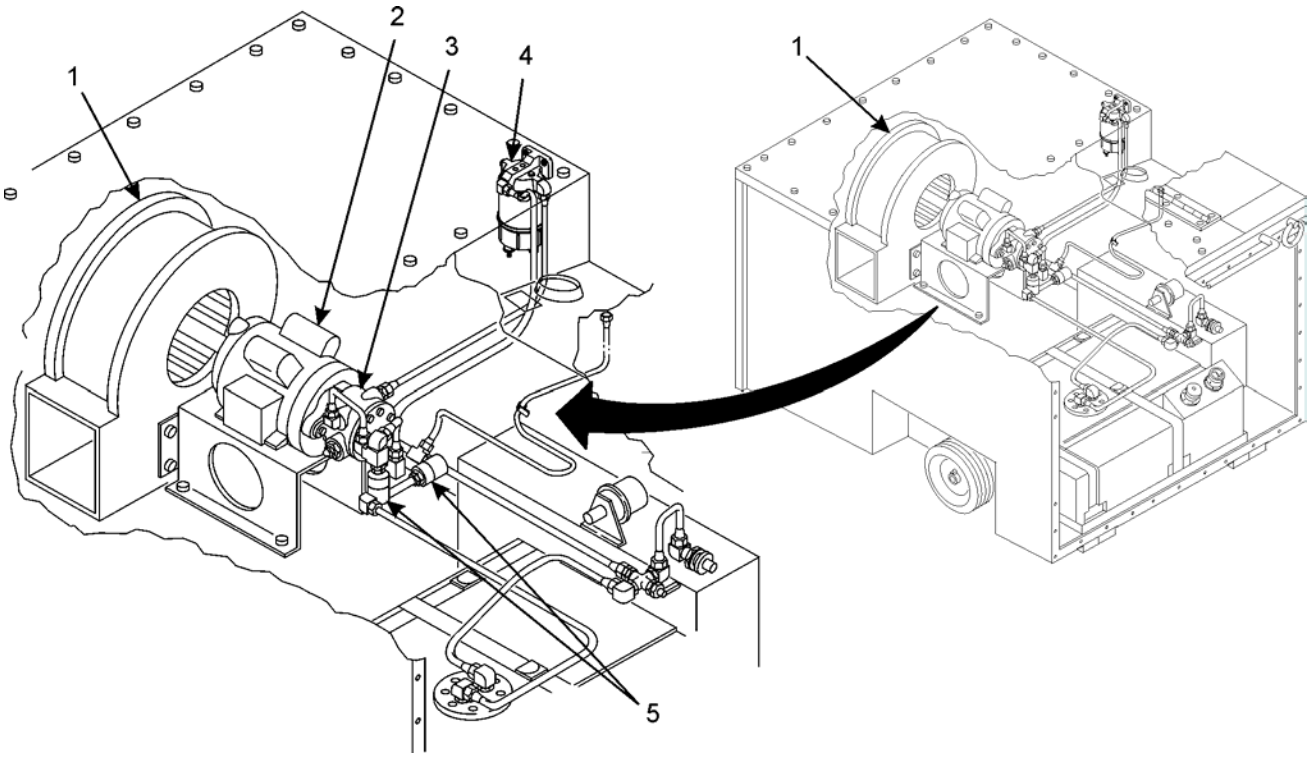
The fuel pump (3) draws fuel from either the ASH’s internal fuel tank or the external fuel source and pressurizes and supplies it to the burner assembly.

Fuel Filter

The low pressure fuel filter (4) removes dirt, debris, and moisture from the fuel before it enters the pump.

Fuel Solenoid Valves

The fuel solenoid valves (5) control the flow of fuel during operation.



INTERIOR COMPONENTS – Continued

Ignition Transformer Assembly

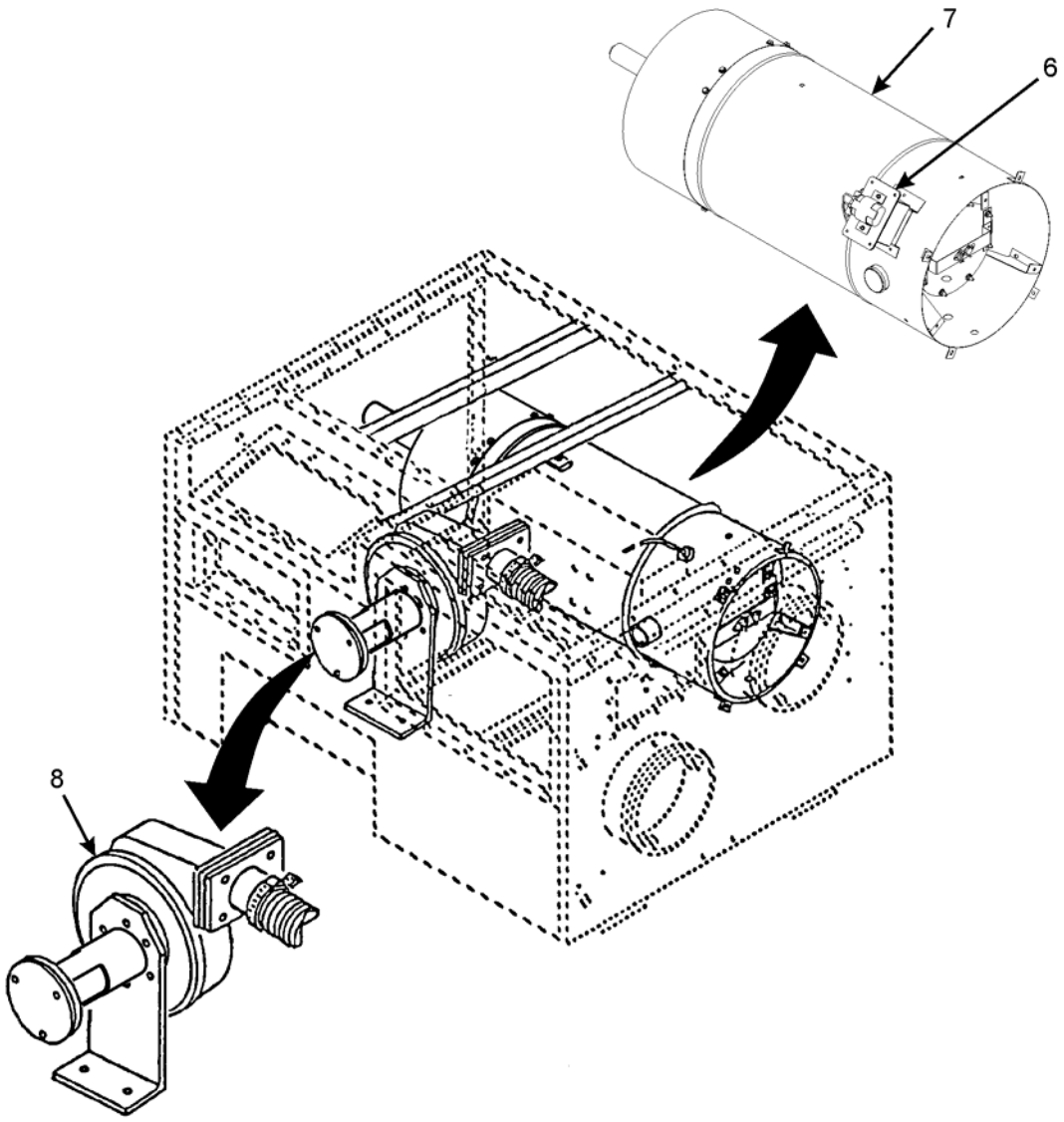
The ignition transformer assembly (6) provides the required high voltage through the ignition leads to the burner assembly electrodes to ignite the fuel.

Heat Exchanger Assembly

The heat exchanger assembly (7) provides the means for heating the supply air.

Combustion Air Fan Assembly

The combustion air fan assembly (8) provides air to the burner assembly.



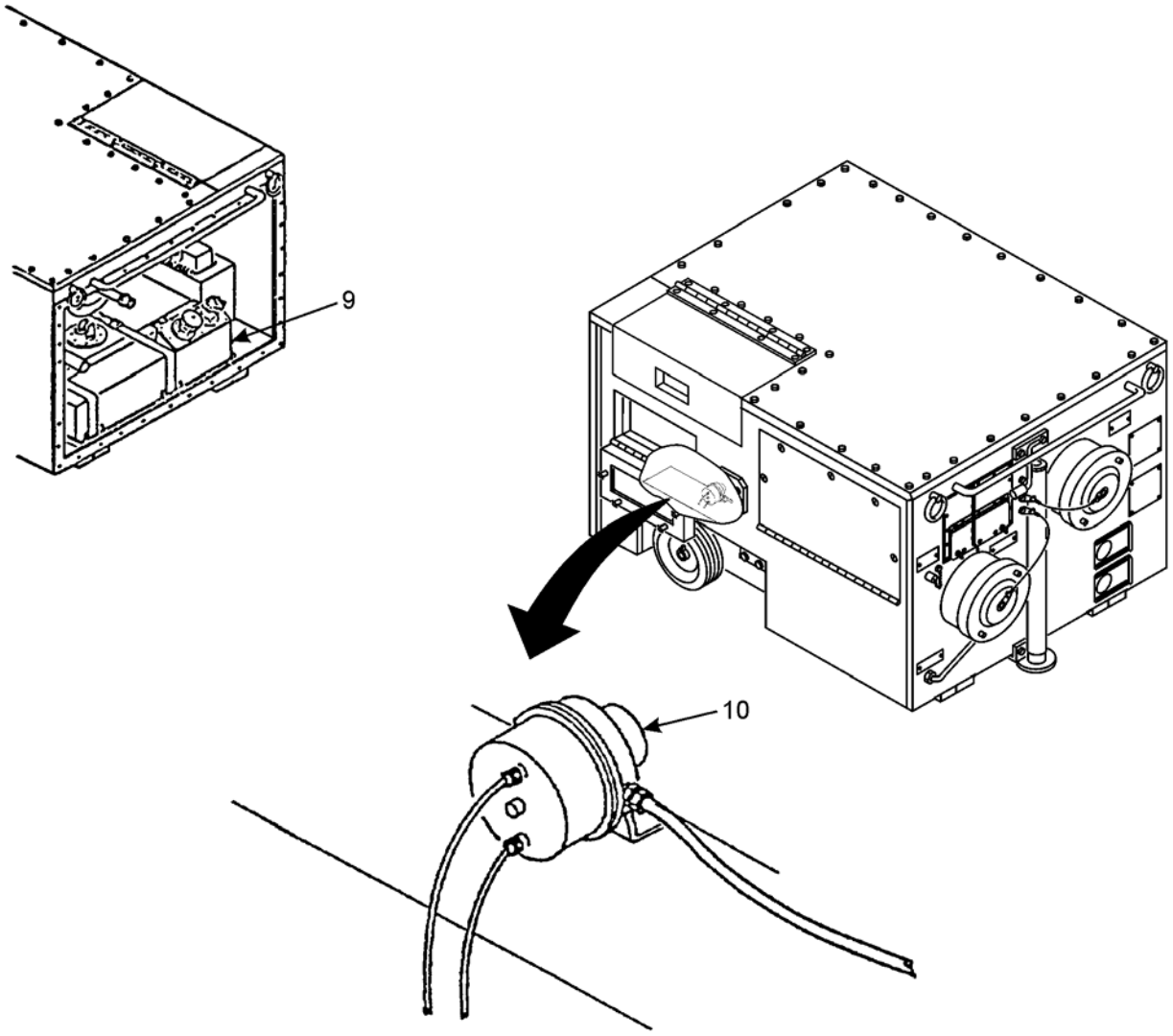
INTERIOR COMPONENTS – Continued

Fuel Tank Assembly

The fuel tank assembly (9) holds 14 gallons (53L) of fuel.

Air Pressure Switch

The air pressure switch (10) detects pressurized airflow to the heat exchanger assembly. The air pressure switch allows the ASH to start only when all doors have been closed.



EQUIPMENT DATA

Table 1 lists equipment data for the ASH. Table 2 lists types of fuel for the ASH. Table 3 lists fuel pressure settings for the ASH.

Table 1. Equipment Data.

EQUIPMENT	DATA
General information	
Model	H-140
Part number	60300-100
National Stock Number (NSN)	4520-01-477-0568
Dimensions	
Length	59 in. (149.9 cm)
Width	40 in. (101.6 cm)
Height	33 in. (83.8 cm)
Diameter of air duct connectors	12 in. (30.5 cm)
Remote control box cable	25 ft (7.62m)
Power cable assembly	25 ft (7.62m)
External fuel hose	25 ft (7.62m)
Supply and return air hose assemblies	12 in. diameter x 15 ft (30.5 cm diameter x 4.57m)
Weight	360 lbs (163 kg)
Operating temperature range	–60°F to +100°F (–51°C to +38°C)
Heating capacity	150,000 BTU/hr at sea level; 140,000 BTU/hr at 4,000 ft (1,220m) elevation
Electrical input	120 Vac; 50/60 Hz; single-phase, grounded; 1,200W (10A) in heating modes
Rated airflow	1,000 cfm (28.3 cubic meters per minute) sea level
Fuel capacity	14 gal (53L) internal fuel tank; connection for single hose, external fuel source
Types of fuel	See Table 2.
Fuel pressure settings (elevation at 50/60 Hz)	See Table 3.

EQUIPMENT DATA – Continued

Table 2. Fuel Types.

AMBIENT TEMPERATURE	SPECIFICATION	TYPE OF FUEL
Above +20°F (–7°C)	A-A-52557	DF-2 (low sulfur no. 2-D)
Above –25°F (–32°C)	A-A-52557	DF-1 (low sulfur no. 1-D)
Above –50°F (–46°C)	VVF-800	DF-A (icing inhibitor added)
Above –50°F (–46°C)	MIL-T-83133	JP-8

NOTE

Fuel pressures depend to a certain extent on the fuel being burned, ambient temperature, and elevation. The most economical ASH operation requires knowledge of application. Pressure settings in Table 3 allow the operator to become familiar with the ASH and its operation.

Table 3. Fuel Pressure Settings.

	FUEL PRESSURE SETTING AT 120 VAC, 50 HZ		FUEL PRESSURE SETTING AT 120 VAC, 60 HZ	
	BELOW –20°F (–29°C)	ABOVE –20°F (–29°C)	BELOW –20°F (–29°C)	ABOVE –20°F (–29°C)
ELEVATION	Psi (kPA)	Psi (kPA)	Psi (kPA)	Psi (kPA)
Sea level to 1,500 ft (0 to 458m)	110 to 120 (758 to 827)	100 to 115 (689 to 793)	120 to 130 (827 to 896)	110 to 125 (758 to 862)
1,500 ft to 3,000 ft (458m to 914m)	105 to 120 (724 to 827)	95 to 110 (655 to 758)	110 to 125 (758 to 862)	105 to 120 (724 to 827)
3,000 ft to 4,500 ft (914m to 1,372m)	100 to 110 (689 to 758)	90 to 105 (621 to 724)	105 to 120 (724 to 827)	100 to 115 (689 to 793)
4,500 ft to 6,000 ft (1,372m to 1,829m)	95 to 105 (655 to 724)	85 to 100 (586 to 689)	100 to 115 (689 to 793)	95 to 110 (655 to 758)

DESCRIPTION AND THEORY OF OPERATION

ARMY SPACE HEATER H-140

NSN 4520-01-477-0568

THEORY OF OPERATION

ELECTRICAL SYSTEM

The electrical system provides for three modes of operation: ventilation mode, automatic heating mode, and manual heating mode. Refer to Figure FO-1, ASH Electrical System Schematic Diagram.

Ventilation Mode

Initially, 120 Vac, 50/60 Hz, single-phase power is applied through main power plug P1 and main POWER CIRCUIT BREAKER CB1 to the contacts of MODE SWITCH S1.

When MODE SWITCH S1 is placed in the VENT position, POWER indicator DS1 will light. Ventilation air fan motor B1 will also begin operating. When ventilation air fan motor B1 is operating, a positive pressure is built up inside the ASH enclosure which closes air pressure switch S5. Air pressure switch S5 must close to allow the combustion air fan motor B2 to operate in the heating modes. Combustion air fan motor B2 does not operate in the ventilation mode.

Power is also available at fuel PURGE SWITCH S4 and is used to purge air from the fuel system. Fuel PURGE SWITCH S4 is spring-loaded to the off position; holding it to the on position operates three-way purge solenoid valve L2. Whenever fuel PURGE SWITCH S4 is held in the up position, fuel is drawn from the fuel source and filtered and pumped back to the fuel tank through fuel transfer valve V1 and purge solenoid valve L2.

Heating Modes

The heating modes are initiated when MODE SWITCH S1 is set to HEAT MANUAL MODE or HEAT AUTO MODE. Continued operation in the heating mode is dependent upon the combustion control relay K1, its associated controls, and the setting of the remote control box. In addition to the 120 Vac, 50/60 Hz power and neutral inputs, the combustion control relay K1 provides two input circuits and two output circuits. One of these inputs, the flame detector circuit, includes the safety devices. The other input, the control box control circuit, includes the temperature control devices and the control relay contacts. Both the flame detector and thermostat circuits must be completed to activate two-way fuel solenoid valve L1.

Flame Detector Circuit

Components comprising the flame detector circuit are overheat thermostat S2 and flame detector Dl.

After positioning FLAME RESET switch S7 to the up position (spring return down), the flame detector circuit will be overridden for approximately 10 to 13 seconds. During this time if the temperature control circuits are closed, power will be applied to fuel solenoid valve L1 through the combustion control relay K1. When ignition occurs, flame detector D1 will complete the flame detector circuit. If the flame detector circuit opens due to an overheat condition in the heat exchanger or a flameout, power will be removed from fuel solenoid valve L1 and FLAME OUT indicator DS3 will light.

Temperature Control Circuits

Components comprising the temperature control circuits are discharge air thermostat S3, overheat thermostat S2, and remote thermostat S6.

ELECTRICAL SYSTEM – Continued

When MODE SWITCH S1 is set to HEAT AUTO MODE, remote thermostat S6 controls the burner heat output from 35°F to 85°F (2°C to 29°C). The burner will cycle to the temperature setting on remote thermostat S6 unless the output exceeds 160°F (71°C). When the temperature exceeds 160°F (71°C), discharge air thermostat S3 shuts off the burner until the outlet temperature is below 130°F (54°C).

When MODE SWITCH S1 is set to HEAT MANUAL MODE, remote thermostat S6 is bypassed and the burner is on continuously unless the outlet temperature exceeds 160°F (71°C). When the outlet temperature exceeds 160°F (71°C), discharge air thermostat S3 shuts off the burner until the outlet temperature is below 130°F (54°C). When the outlet air temperature exceeds 200°F (93°C), overheat thermostat S2 shuts down the burner but the ventilation air fan and the combustion air fan continue to operate. HIGH TEMP indicator DS2 will light. Flame detector D1 will sense no flame and FLAME OUT indicator DS3 will light.

FUEL SYSTEM

The fuel system incorporates a 14 gallon (53L) internal fuel tank. Fuel transfer valve V1 enables ASH operation from the internal fuel tank or from an external fuel source using a 25 foot (7.62m) fuel hose.

Purge System

The purge system enables the operator to purge air from the fuel system before initial startup of the ASH. Purging is also required when operating from an external fuel source or after the fuel system has been allowed to run dry.

CAUTION

Do not operate the ASH without fuel. Operation without fuel will result in damage to the fuel pump.

The INTERNAL TANK/EXTERNAL TANK selector valve must be fully positioned to either setting. Any selector valve setting between INTERNAL TANK and EXTERNAL TANK may result in fuel starvation and damage to the fuel pump.

The fuel system must be purged daily, even when the external fuel tank is being used or the ASH is in the ventilation mode or the fuel pump may be damaged.

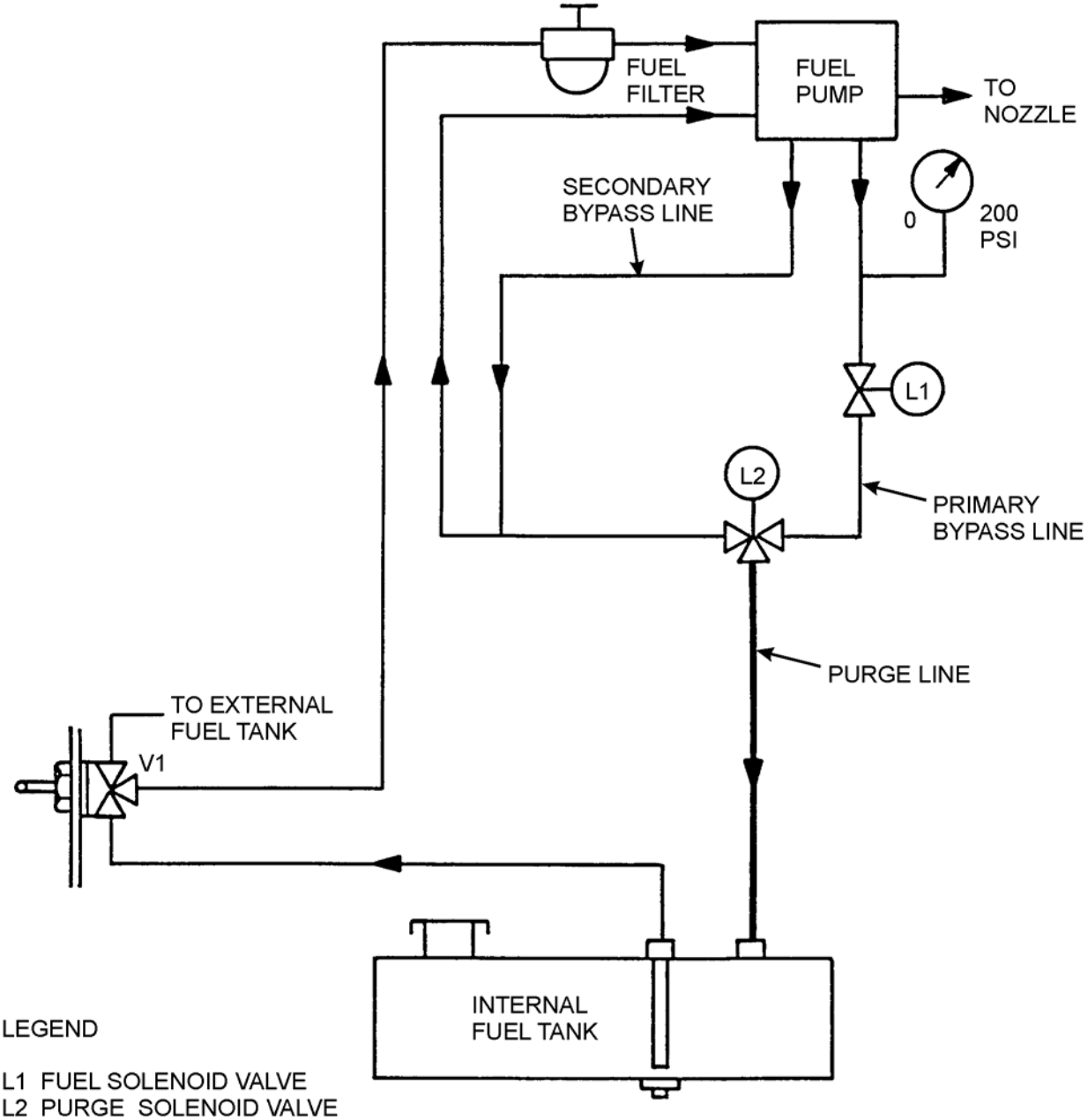
The fuel system is purged by turning MODE SWITCH S1 to the VENT position and holding fuel PURGE SWITCH S4 to the up position until the fuel pressure gage indicates greater than zero. When fuel PURGE SWITCH S4 is released, the pressure must be greater than 10 psi (69 kPa).

If the fuel pressure is not greater than 10 psi (69 kPa), purging must be continued until the proper pressure is obtained. Priming the fuel system at extremely low ambient temperatures with the correct fuels presents no problems, except that it takes slightly longer due to the greater restriction of cold fuel circulating through the filter.

Ventilation Mode

In the ventilation mode, fuel is drawn through the low pressure filter by the fuel pump. The fuel is then pumped through two-way fuel solenoid valve L1 to the three-way purge solenoid valve L2. Since purge solenoid valve L2 is not energized, fuel passes through purge solenoid valve L2 and returns to the inlet side of the fuel pump. If purge solenoid valve L2 is energized, the ASH will operate as described in the Purge System subparagraph above.

FUEL SYSTEM – Continued



LEGEND

L1 FUEL SOLENOID VALVE
L2 PURGE SOLENOID VALVE
V1 FUEL TRANSFER VALVE

FUEL SYSTEM – Continued

Heating Modes

In the heating modes, fuel flow is the same as during the ventilation mode. Upon heat demand, fuel solenoid valve L1 opens and fuel is supplied to the nozzle at the set pressure. Unused fuel is bypassed back to the pump through the secondary bypass line. When desired air temperature is reached, overheat thermostat S2 activates, or combustion control relay K1 activates, closing fuel solenoid valve L1. When fuel solenoid valve L1 is closed, all fuel will return to the pump through the primary bypass line.

Additional Components

The fuel tank drain provides a means to drain the tank when required.

The fuel tank gage mechanically indicates the level of fuel in the internal fuel tank.

The fuel filler neck provides a means to fill the fuel tank with fuel. A fuel strainer is located inside the neck to trap foreign objects before they enter the fuel tank. The screen can be removed and cleaned for reuse.

The fuel pressure gage indicates purge and operating fuel pressures.

AIRFLOW SYSTEM

The airflow system is divided into two separate airflows: combustion airflow and circulating airflow. In circulating airflow, the air is either ventilated (ambient) air or heated air. Major components include the ventilation air fan, heat exchanger, burner, and combustion air fan.

Ventilation Mode

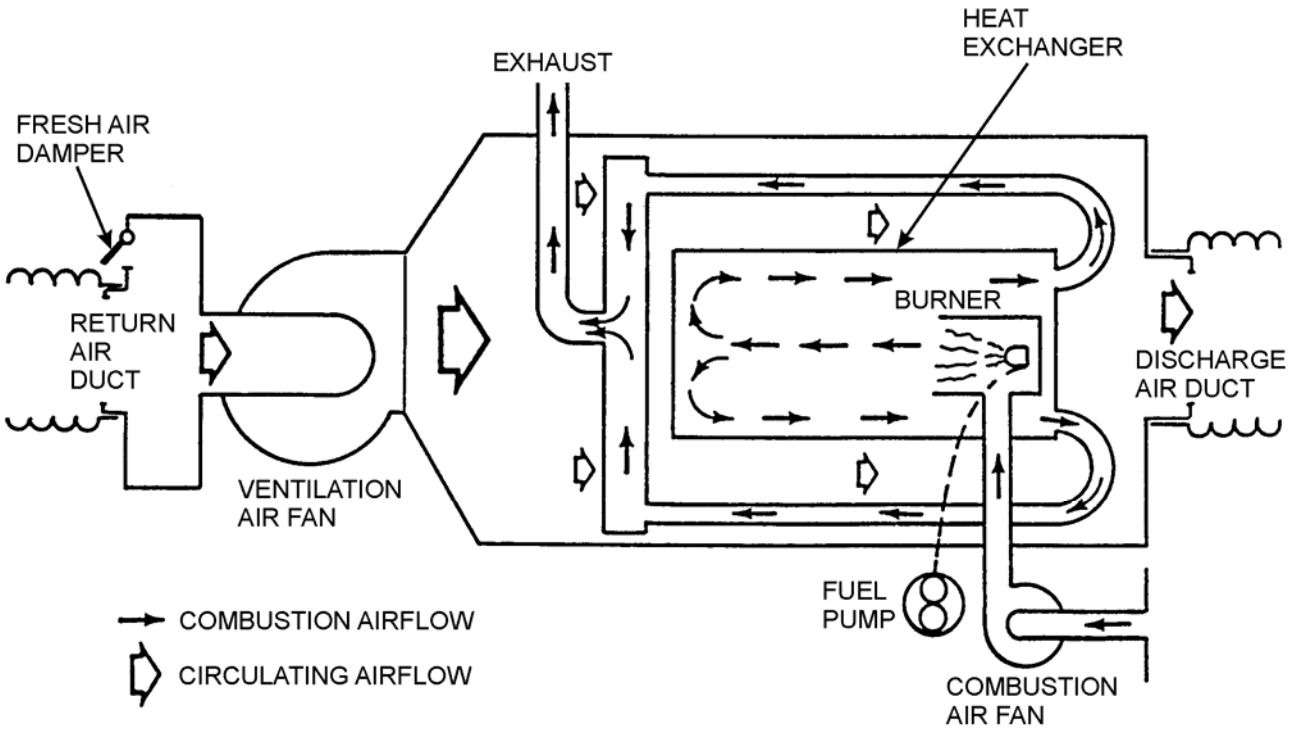
Ventilated air is drawn through the return air duct and/or the fresh air damper by the ventilation air fan. The ASH enclosure becomes pressurized and air moves around the heat exchanger and is discharged through the supply air duct.

Heating Modes

Heated air is identical to that described for the ventilation mode, except that the air passing over the heat exchanger is heated by the heat exchanger and regulated by either the remote control box (auto mode) or the discharge air thermostat (manual mode).

Combustion airflow is provided by the combustion air fan. The airflow is applied to the burner, mixed with vaporized fuel, and ignited. The resulting hot gases pass through the heat exchanger and exit as exhaust.

AIRFLOW SYSTEM – Continued



CHAPTER 2

OPERATOR INSTRUCTIONS
FOR
ARMY SPACE HEATER H-140

OPERATOR INSTRUCTIONS

ARMY SPACE HEATER H-140

NSN 4520-01-477-0568

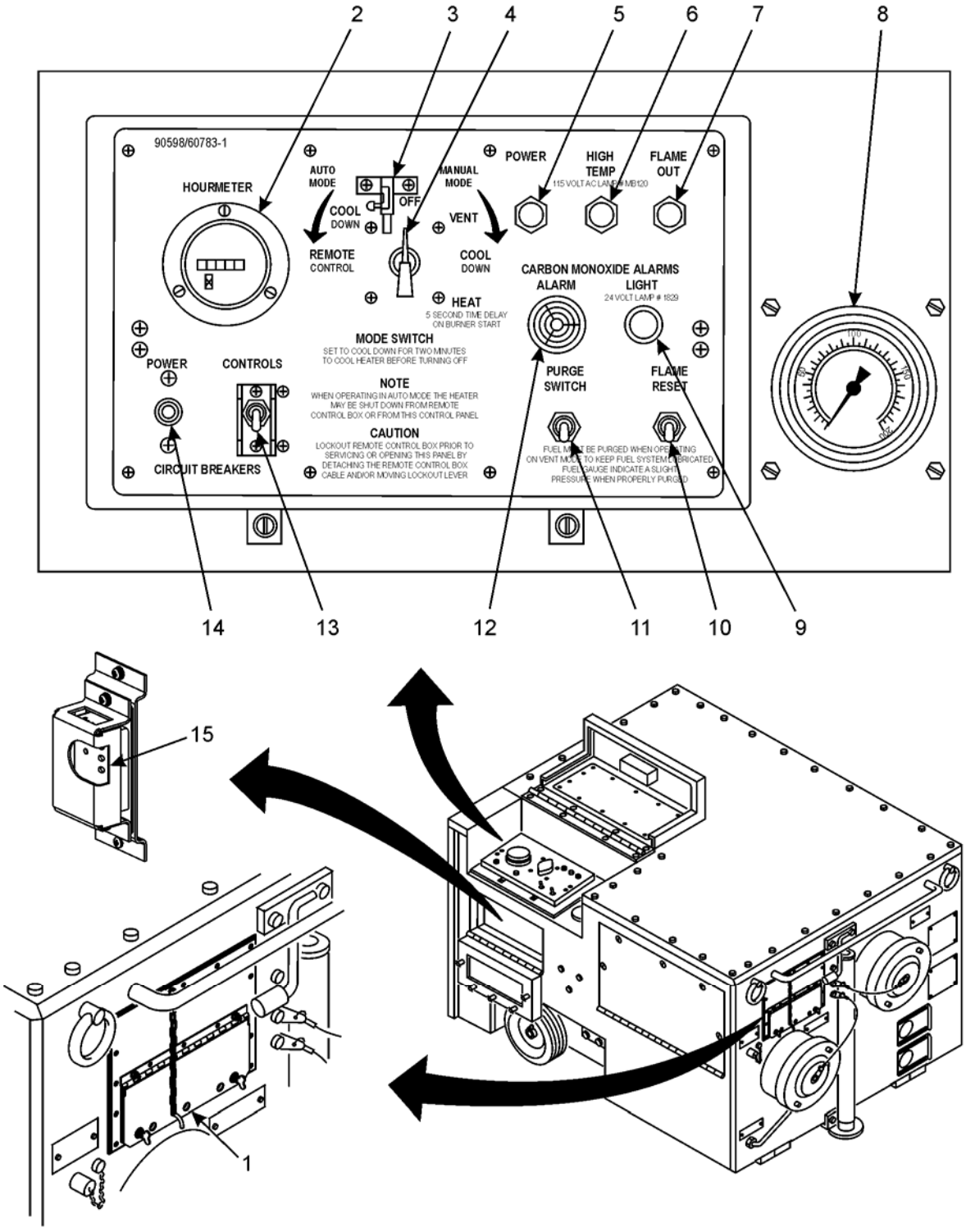
DESCRIPTION AND USE OF OPERATOR CONTROLS AND INDICATORS

INTRODUCTION

The Description and Use of Operator Controls and Indicators contains illustrations that show the location of each control and indicator for operation of the ASH. Each control and indicator is clearly labeled as it appears on the equipment. Find numbers on the illustration are keyed to the tabular listing which contains the name, based on the panel markings, and the functional description of each control and indicator.

ASH CONTROL PANEL AND ASH FRONT SIDE CONTROLS AND INDICATORS

Table 1 describes the controls and indicators for the ASH control panel and ASH front side.



ASH CONTROL PANEL AND ASH FRONT SIDE CONTROLS AND INDICATORS – Continued

Table 1. ASH Control Panel and ASH Front Side Controls and Indicators.

KEY	CONTROL OR INDICATOR	FUNCTION
1	Fresh air damper assembly	Allows fresh air to enter circulating airflow system when open.
2	HOURMETER (total time (TT))	Indicates total number of hours burner has been operated.
3	Remote lockout	Prevents inadvertent selection of AUTO MODE.
4	MODE SWITCH	
	MANUAL MODE	Places ASH in VENT, COOL DOWN, HEAT, or OFF mode.
	AUTO MODE	Places ASH in COOL DOWN or REMOTE CONTROL mode.
5	POWER indicator	Lights when power is connected and MODE SWITCH is set to any mode other than OFF.
6	HIGH TEMP indicator	Lights when ASH discharge air temperature exceeds limit of temperature limit switch setting.
7	FLAME OUT indicator	Lights when burner flameout occurs.
8	Fuel pressure gage	Indicates fuel system pressure.
9	CARBON MONOXIDE ALARMS	
	LIGHT	Lights when carbon monoxide is detected in circulating airflow system.
10	FLAME RESET switch	Resets combustion control relay K1.
11	PURGE SWITCH	Purges air from fuel system.
12	CARBON MONOXIDE ALARMS	
	ALARM	Emits audible alarm when carbon monoxide is detected in circulating airflow system.
13	CONTROLS CIRCUIT BREAKER	Trips when overcurrent condition exists within ASH control circuitry. Must be manually reset to up position.
14	POWER CIRCUIT BREAKER	Trips to protect main power circuits within ASH during overcurrent condition. Must be manually reset by pressing button.
15	Test/silence button	Tests or resets carbon monoxide detector alarms.

ASH REAR SIDE CONTROLS AND INDICATORS

Table 2 describes the controls and indicators for the ASH rear side.

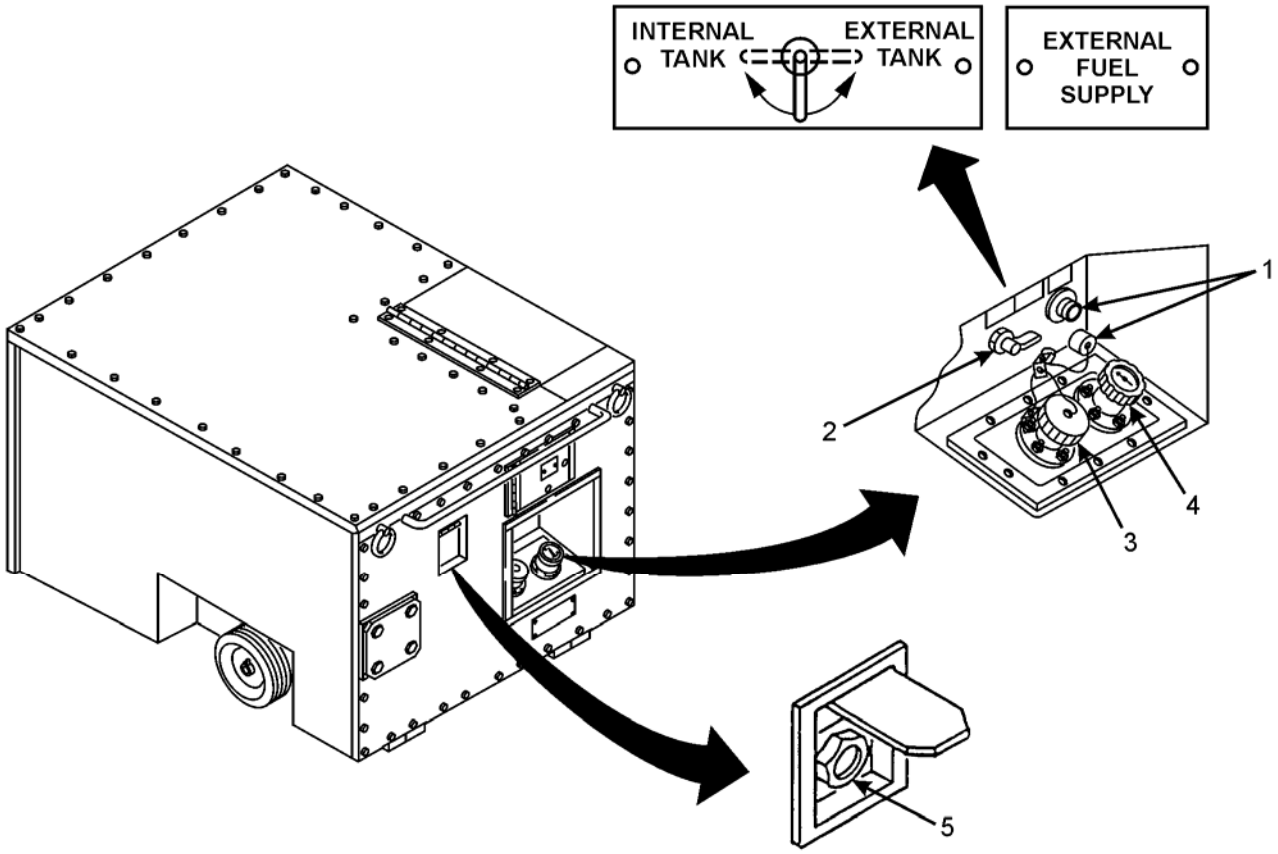


Table 2. ASH Rear Side Controls and Indicators.

KEY	CONTROL OR INDICATOR	FUNCTION
1	EXTERNAL FUEL SUPPLY connection	Connects external fuel source to ASH.
2	INTERNAL TANK/ EXTERNAL TANK selector valve	Selects either internal fuel tank or external fuel source (if connected).
3	Fuel filler neck and cap	Allows internal fuel tank to be serviced.
4	Fuel gage	Indicates internal tank fuel level.
5	Sight glass	Allows for visual verification of ignition or burner operation.

REMOTE CONTROL BOX CONTROLS AND INDICATORS

Table 3 describes the controls and indicators for the remote control box.

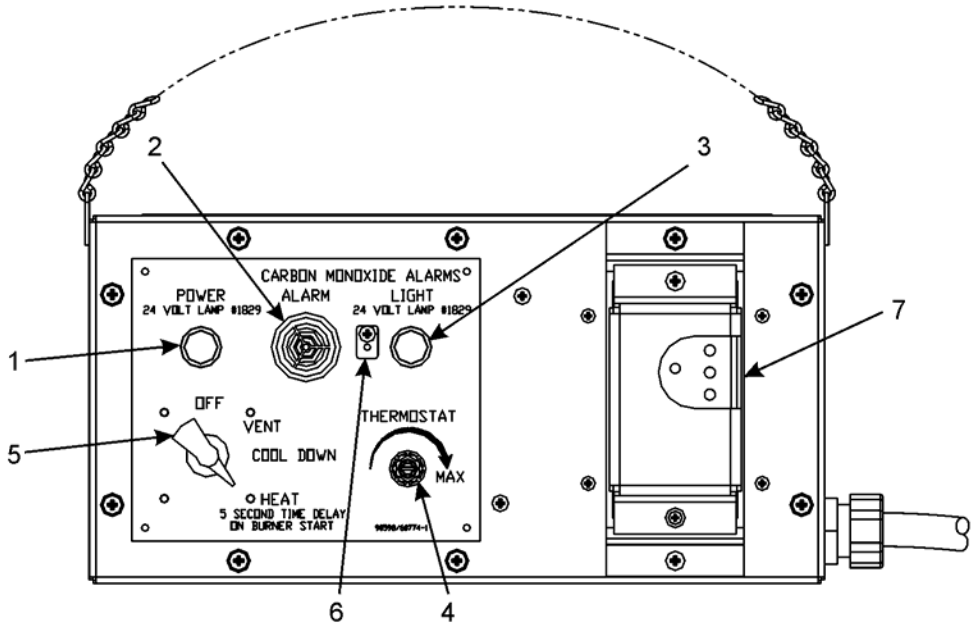


Table 3. Remote Control Box Controls and Indicators.

KEY	CONTROL OR INDICATOR	FUNCTION
1	POWER indicator	Lights when power is connected and mode switch is set to any mode other than OFF.
2	CARBON MONOXIDE ALARMS	
	ALARM	Emits audible alarm when carbon monoxide is detected in circulating airflow system.
3	CARBON MONOXIDE ALARMS	
	LIGHT	Lights when carbon monoxide is detected in circulating airflow system.
4	THERMOSTAT control	Adjusts regulated temperature from 35°F to 85°F (2°C to 29°C).
5	Mode switch	Places ASH in VENT, COOL DOWN, or HEAT modes of operation.
6	Temperature sensor	Senses ambient temperature.
7	Test/silence button	Tests or resets carbon monoxide detector alarms.

OPERATOR INSTRUCTIONS

ARMY SPACE HEATER H-140

NSN 4520-01-477-0568

OPERATION UNDER USUAL CONDITIONS

INITIAL SETUP:

Test Equipment
None

Tools and Special Tools
Cross tip screw driver (WP 0060 00)

Personnel Required
One

References
WP 0002 00, tables 2 and 3
WP 0014 00
WP 0019 00
FM 10-67-1

Materials/Parts
None

Equipment Condition
None

WARNING

Contact with hot components can cause burns. Allow ASH to cool down before attempting service, inspection, or maintenance activity.

SITE REQUIREMENTS

Location

1. Locate ASH approximately 7 feet (2.14m) from shelter, about midway between shelter supply and return air connections.
2. ASH supply and return air duct openings must be facing shelter connections.
3. Power source must be located within 25 feet (7.62m) of ASH.

CAUTION

Use only one external fuel hose (25 feet (7.62m)) when connecting to external fuel source or damage to ventilation air fan motor and fuel pump may result.

4. External fuel source must be located within 25 feet (7.62m) of ASH.

SITE REQUIREMENTS – Continued

Terrain

WARNING

FOR FUEL SPILLS, REFER TO FM 10-67-1, CONCEPTS AND EQUIPMENT OF PETROLEUM OPERATIONS.

Fuel is flammable and toxic to eyes, skin, and respiratory tract. Skin/eye protection is required. Avoid repeated/prolonged contact. Use only in well-ventilated areas. Keep away from open flames or other sources of ignition. Post FUEL FLAMMABLE/NO SMOKING signs around the area. Be sure a fire extinguisher is available.

Fuel on clothing can be fatal if ignited by a static discharge. If fuel gets on clothes, leave the refueling area as soon as possible, remove clothes, and wash skin with warm, soapy water before getting dressed.

Spilled fuel creates a flammable, vapor-air mixture and fire can take place. Improper positioning of external fuel source can cause fuel tank to overflow. Stop refueling immediately if fuel spill occurs.

1. Stow wheel assemblies as follows:

WARNING

Use care when using the jack assembly or when raising or lowering the wheel assemblies. Fingers or hands may be pinched causing injury to personnel.

CAUTION

Do not set up the ASH on extremely unleveled terrain (greater than 10 degrees (178 mils)) from true horizontal position). Improper operation or damage to equipment may result.

Do not overextend jack or damage to jack may result.

   a. Raise front of ASH by extending attached jack assembly (1).

   b. Remove wheel pin (2) and move wheels (3) up toward rear of ASH and install wheel pin.

   c. Lower front of ASH.

2. Level ASH by adjusting front with attached jack assembly (1) so that it does not exceed 10 degree (178 mils) incline.

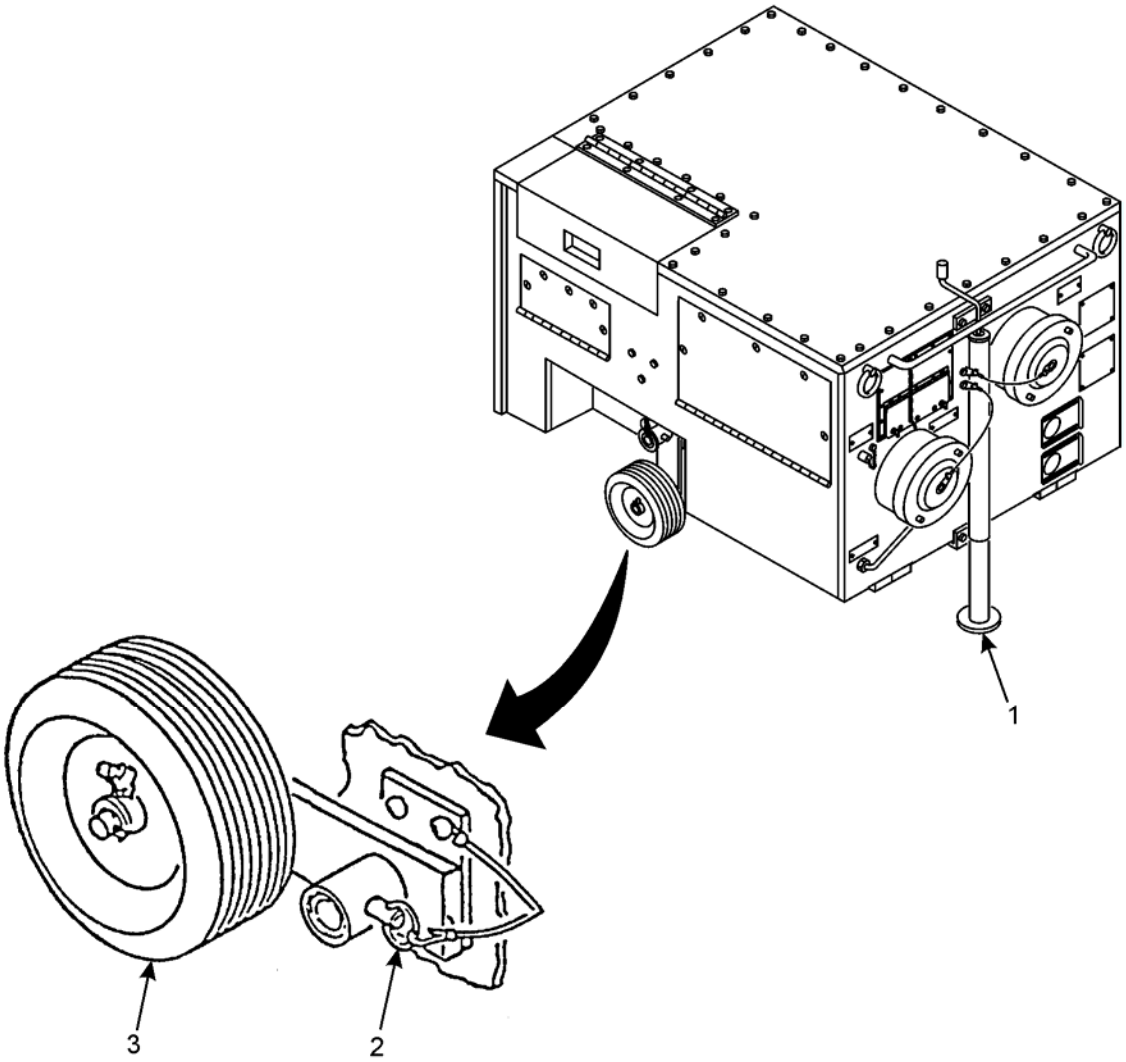
3. Area in front of ASH must be clear of objects that would interfere with proper positioning of supply and return air ducts or airflow to fresh air damper.

4. Area around and above exhaust pipe (6 feet (1.83m) from ground level) must be clear of obstacles.

5. Area on right side of ASH must allow access to operate controls on control panel.

6. Terrain for external fuel source should be as level as possible. External fuel source must be placed not lower than 12 inches (30.5 cm) below base of ASH and not higher than 10 feet (3m) above ASH.

SITE REQUIREMENTS – Continued



ASSEMBLY AND PREPARATION FOR USE

General Precautions

WARNING

FOR FUEL SPILLS, REFER TO FM 10-67-1, CONCEPTS AND EQUIPMENT OF PETROLEUM OPERATIONS.

Fuel is flammable and toxic to eyes, skin, and respiratory tract. Skin/eye protection is required. Avoid repeated/prolonged contact. Use only in well-ventilated areas. Keep away from open flames or other sources of ignition. Post FUEL FLAMMABLE/NO SMOKING signs around the area. Be sure a fire extinguisher is available.

Fuel on clothing can be fatal if ignited by a static discharge. If fuel gets on clothes, leave the refueling area as soon as possible, remove clothes, and wash skin with warm, soapy water before getting dressed.

Spilled fuel creates a flammable, vapor-air mixture and fire can take place. Improper positioning of external fuel source can cause fuel tank to overflow. Stop refueling immediately if fuel spill occurs.

1. Ensure that supply and return air duct cover assemblies are removed prior to operation.
2. Perform Before PMCS (WP 0014 00). Notify unit maintenance if any discrepancies are found.

ASSEMBLY AND PREPARATION FOR USE – Continued

Fuel Tank Selection

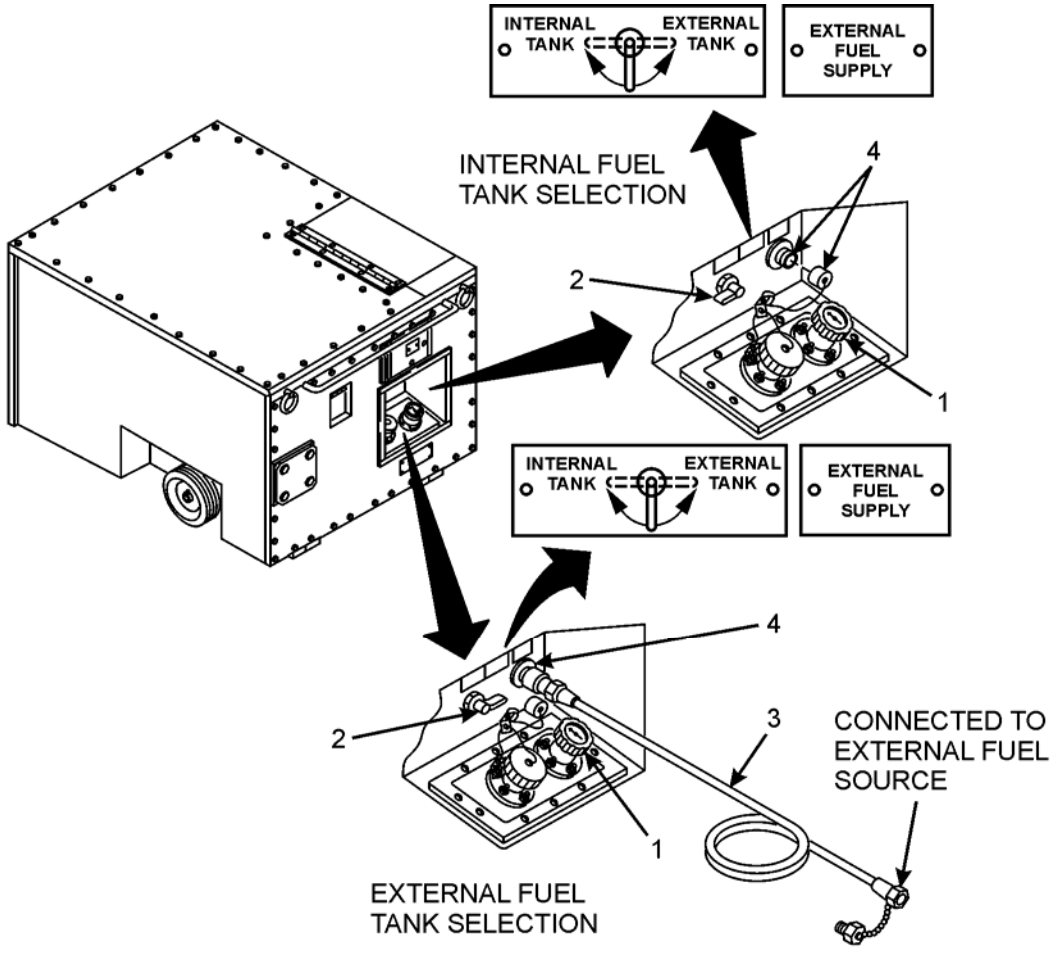
1. Check fuel gage (1) and fill internal fuel tank as required.

CAUTION

The INTERNAL TANK/EXTERNAL TANK selector valve must be fully positioned to either setting. Any selector valve setting between INTERNAL TANK and EXTERNAL TANK may result in fuel starvation and damage to the fuel pump.

2. Set fuel selector valve (2) to INTERNAL TANK position.

3. If external fuel line (3) is attached to external fuel connection (4), set fuel selector valve (2) to EXTERNAL TANK position.



ASSEMBLY AND PREPARATION FOR USE – Continued

Fueling

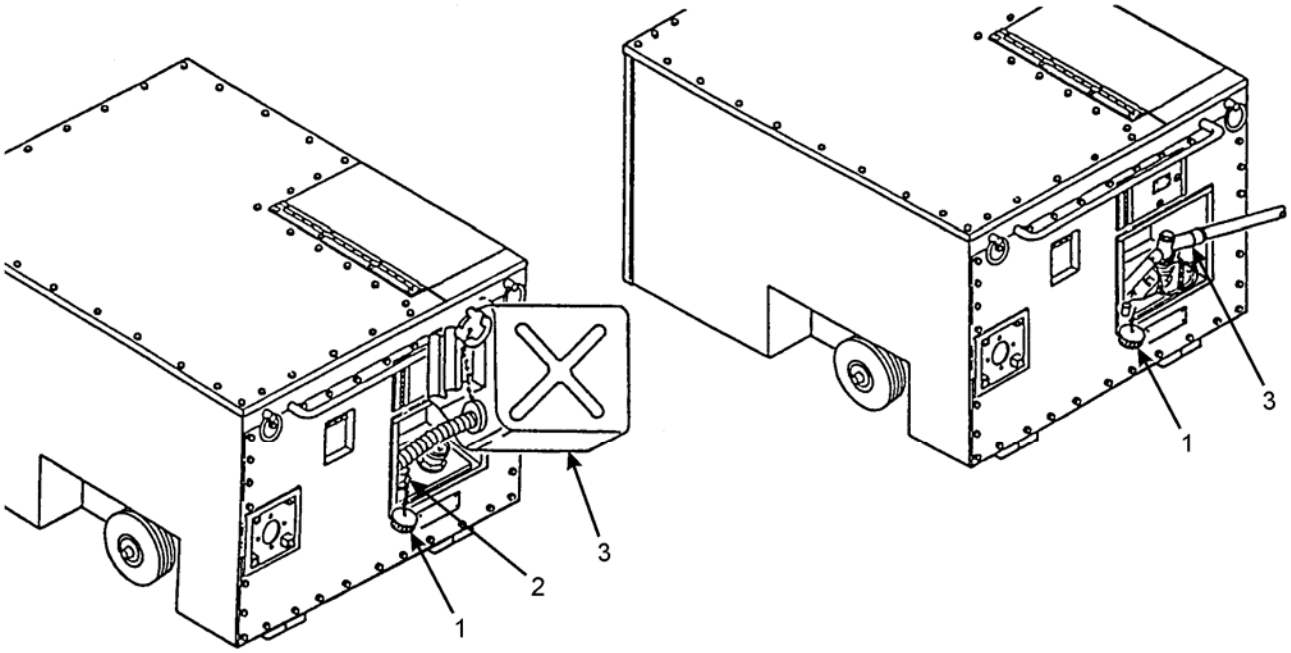
1. Remove fuel cap (1).

2. Provide metal-to-metal contact between fuel tank (2) and dispenser (3) to avoid sparks. Grounding cable, bonding strap, or equivalent may be used.

NOTE

If diesel fuel is not available, JP8 turbine fuel may be used as an alternate. However, greater heating efficiency will be obtained using one of the diesel fuels recommended in step 3.

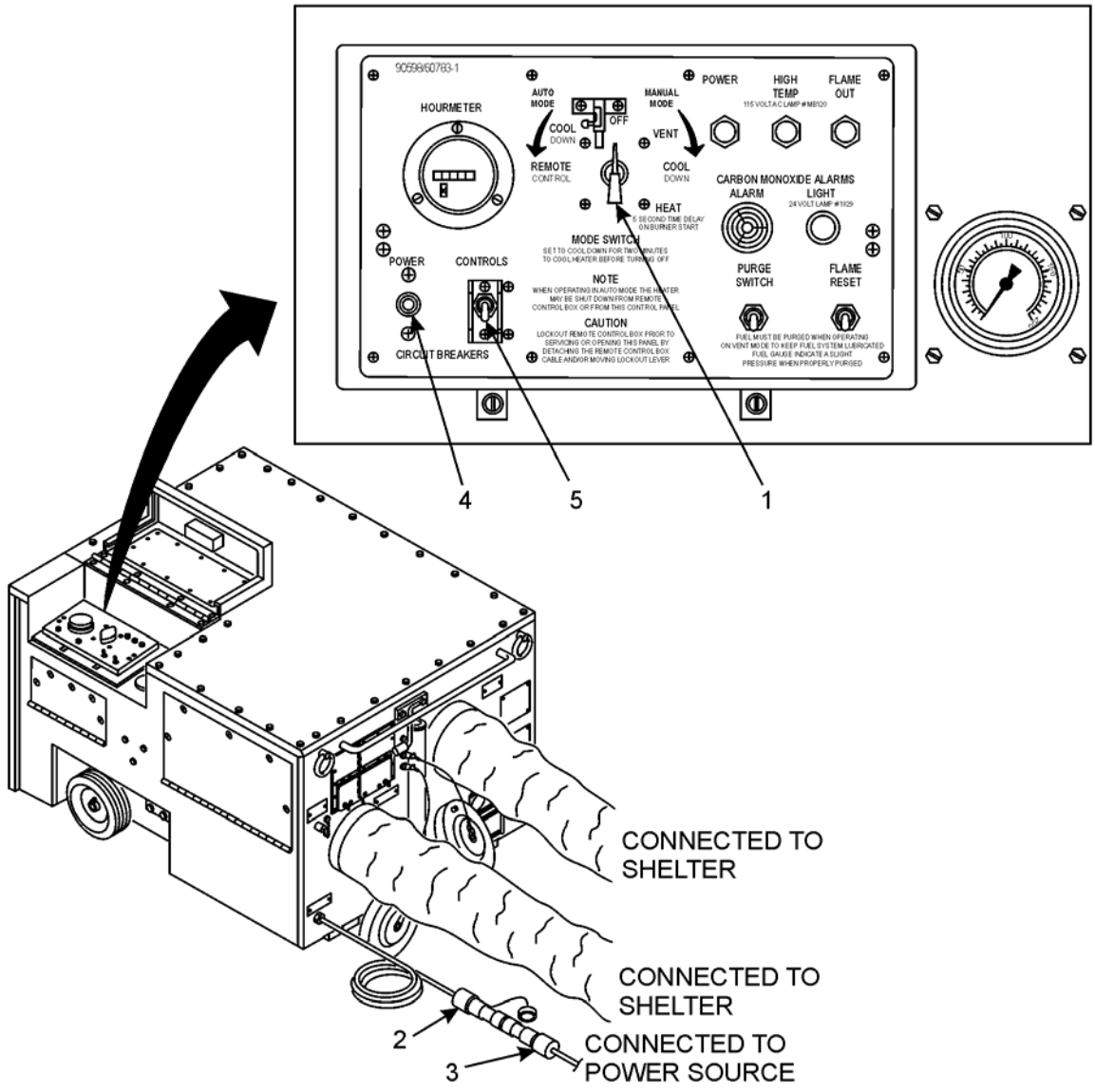
3. Fill fuel tank with 14 gallons (53L) of fuel, depending upon ambient temperature (WP 0002 00, Table 2).



ASSEMBLY AND PREPARATION FOR USE – Continued

Power Cable and Supply and Return Air Hose Assemblies Connections

1. Ensure that control panel MODE SWITCH (1) is set to OFF position.
2. Connect supply and return air hose assemblies to ASH (WP 0019 00).
3. Connect ASH power cable (2) to power cable adapter (3).
4. Press control panel POWER CIRCUIT BREAKER (4) button and position CONTROLS CIRCUIT BREAKER (5) to up position.



OPERATING PROCEDURES

Ventilation Mode

1. Perform Assembly and Preparation for Use procedures (WP 0005 00-4 thru -7).

2. Operate 120 Vac, 50/60 Hz power source as applicable.

CAUTION

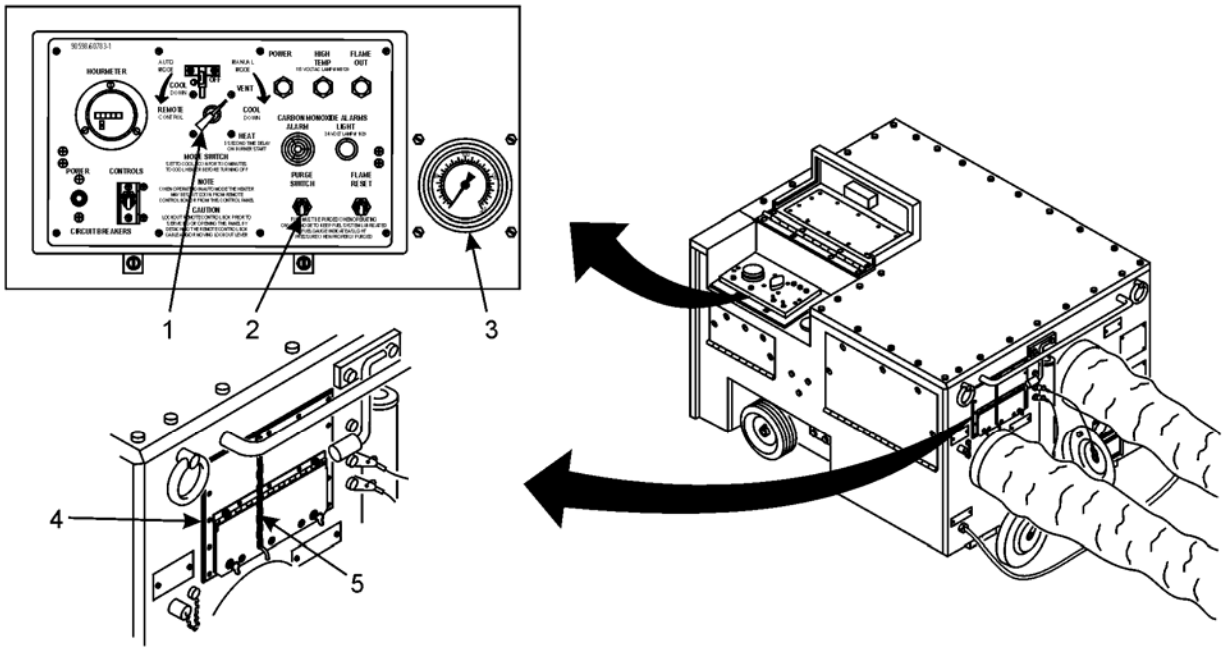
Do not operate the ASH without fuel. Operating without fuel will result in damage to the fuel pump.

The INTERNAL TANK/EXTERNAL TANK selector valve must be fully positioned to either setting. Any selector valve setting between INTERNAL TANK and EXTERNAL TANK may result in fuel starvation and damage to the fuel pump.

a. Set control panel MODE SWITCH (1) to VENT position. Ventilation air fan assembly should begin operating immediately.

b. Push control panel fuel PURGE SWITCH (2) up to on position for 10 seconds to purge air from fuel lines. Fuel pressure gage (3) indication will drop while PURGE SWITCH is in on position and will return to approximately 20 psi (138 kPa) when released.

c. Adjust fresh air damper assembly (4) for desired amount of fresh air by adjusting chain (5).



OPERATING PROCEDURES – Continued

Heating Mode – HEAT AUTO MODE

CAUTION

Do not operate the ASH in the heating mode for more than 10 minutes when ambient temperature is above 100°F (38°C). Damage to equipment may result. Operating in the ventilation mode may be done at any temperature.

1. Set control panel MODE SWITCH (2) to COOL DOWN position.

CAUTION

Do not operate the ASH in the HEAT AUTO MODE if ignition arc is not present. Damage to equipment may result.

2. Look through sight glass (1) and check for ignition arc. Ignition arc should be steady and bright blue in color. If ignition arc is not seen, do not operate ASH.

NOTE

After a flameout, the FLAME RESET switch locks out for 30 seconds to purge the heat exchanger assembly of any unburnt fuel.

3. Set control panel MODE SWITCH (2) to REMOTE CONTROL position.

4. Set remote control panel mode switch (5) to HEAT position and proceed as follows:

   a. If FLAME OUT indicator (3) lights, wait 30 seconds and push FLAME RESET switch (4).

   b. If FLAME OUT indicator (3) lights after three attempts to reset, notify unit maintenance.

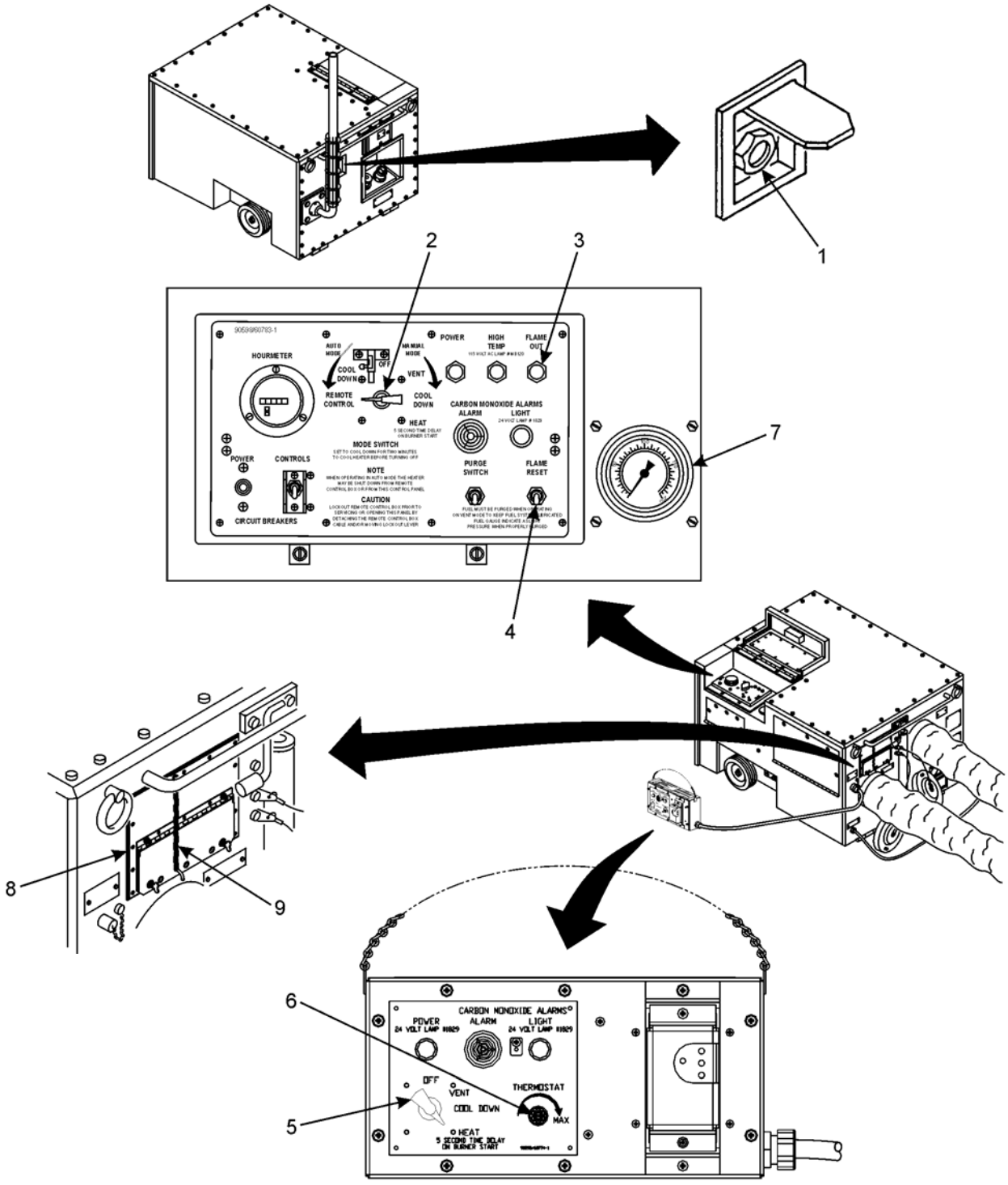
5. Adjust remote control panel THERMOSTAT control (6) for desired temperature.

6. Check fuel pressure gage (7) for proper pressure at elevation and voltage frequency (50/60 Hz) (WP 0002 00, Table 3). If pressure is not correct, notify unit maintenance.

7. After burner lights up, observe flame through sight glass (1). If flame is not bright and steady, notify unit maintenance to adjust fuel pressure.

8. Adjust fresh air damper assembly (8) for desired amount of fresh air by adjusting chain (9).

OPERATING PROCEDURES – Continued



OPERATING PROCEDURES – Continued

Heating Mode – HEAT MANUAL MODE

CAUTION

Do not operate the ASH in the heating mode for more than 10 minutes when ambient temperature is above 100°F (38°C). Damage to equipment may result. Operating in the ventilation mode may be done at any temperature.

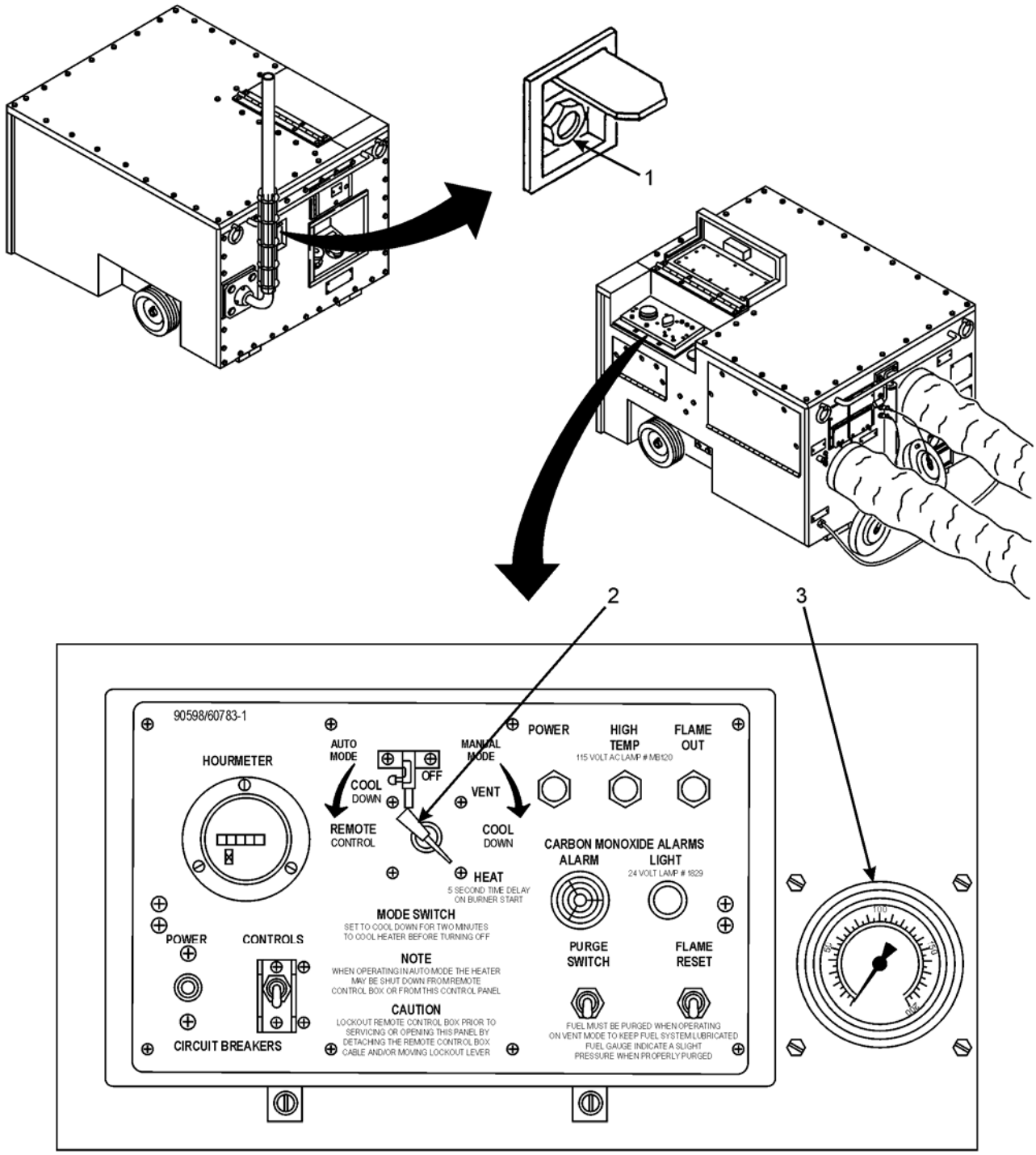
1. If ASH is operating in HEAT AUTO MODE, proceed to steps 5 thru 8. If not, proceed to steps 2 thru 8.
2. Perform Assembly and Preparation for Use procedures (WP 0005 00-4 thru -7).
3. Set control panel MODE SWITCH (2) to COOL DOWN position.

CAUTION

Do not operate ASH in the HEAT MANUAL MODE if ignition arc is not present. Damage to equipment may result.

4. Look through sight glass (1) and check for ignition arc. Ignition arc should be steady and bright blue in color. If ignition arc is not seen, do not operate ASH.
5. Set control panel MODE SWITCH (2) to HEAT MANUAL MODE position.
6. Look through sight glass (1) and ensure that flame is present. If flame is not bright and steady, notify unit maintenance.
7. Check fuel pressure gage (3) for proper pressure at elevation and voltage frequency (50/60 Hz) (WP 0002 00, Table 3). If pressure is not correct, notify unit maintenance.
8. If ambient temperature is below 0°F (–18°C), wait 30 to 45 seconds before performing Shutdown procedure (WP 0005 00-13).

OPERATING PROCEDURES – Continued



OPERATING PROCEDURES – Continued

Shutdown

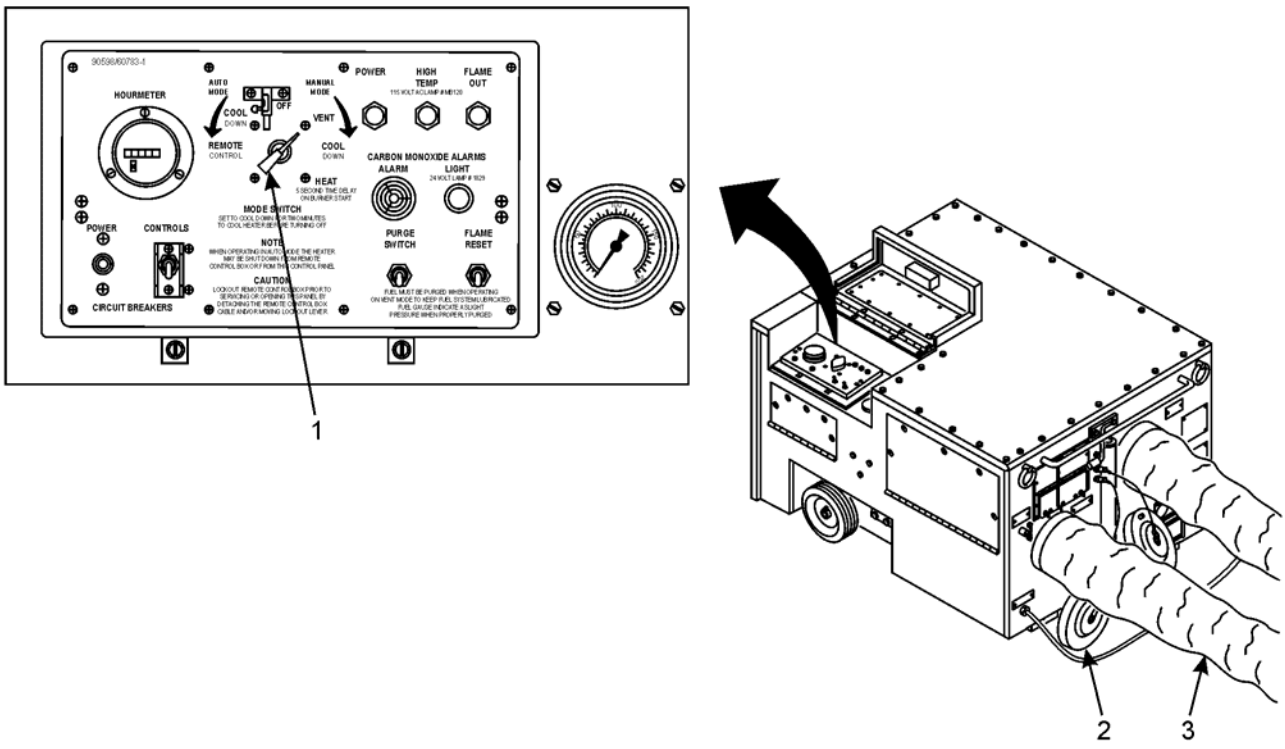
WARNING

Heat exchanger overheating may damage the ASH and under some conditions a safety hazard may result. An overheat shutdown occurs when the combustion air and ventilation air fan assemblies are turned off at the same time when in the heating modes. Always set the control panel MODE SWITCH to the VENT position for at least 2 minutes when shutting down the ASH from the heating modes.

1. Set control panel MODE SWITCH (1) to VENT position for at least 2 minutes prior to shutdown.

2. Set control panel MODE SWITCH (1) to OFF position to shut down ASH.

3. Install return air duct cover (2) if air hose (3) was not attached.



END OF WORK PACKAGE

OPERATOR INSTRUCTIONS

ARMY SPACE HEATER H-140

NSN 4520-01-477-0568

OPERATION UNDER UNUSUAL CONDITIONS

INITIAL SETUP:

Test Equipment
None

References
WP 0005 00

Tools and Special Tools
Gloves (item 6, WP 0058 00)

Materials/Parts
None

Personnel Required
One

Equipment Condition
None

UNUSUAL ENVIRONMENT/WEATHER CONDITIONS

Operating in Extreme Cold

WARNING

Touching cold metal with exposed skin will cause skin to bond to metal. Gloves are required when touching cold metal objects. Do not touch cold metal parts with bare hands. Frostbite can cause permanent injury.

1. Be careful when handling supply and return air hose assemblies to avoid cracking hoses.
2. Keep supply and return duct cover assemblies installed when not in use.
3. Perform Operation Under Usual Conditions procedures (WP 0005 00).

Operating in Extreme Heat

1. Do not operate in heating modes for more than 10 minutes when ambient temperature is above 100°F (38°C).
2. Perform Operation Under Usual Conditions procedures (WP 0005 00).

Operating in Strong Winds

1. Strong winds will not affect ASH performance.
2. Perform Operation Under Usual Conditions procedures (WP 0005 00).

OPERATOR INSTRUCTIONS

ARMY SPACE HEATER H-140

NSN 4520-01-477-0568

OPERATION UNDER UNUSUAL CONDITIONS

UNUSUAL ENVIRONMENT/WEATHER CONDITIONS – Continued

Operating in Sand or Dust

1. Remove any sand or dust from supply and return duct air screens before installing supply and return air hose assemblies or operating combustion air fan assembly.
2. Keep supply and return duct cover assemblies installed when not in use.
3. Keep all doors and panels closed whenever possible.
4. Perform Operation Under Usual Conditions procedures (WP 0005 00).

END OF WORK PACKAGE

OPERATOR INSTRUCTIONS

ARMY SPACE HEATER H-140

NSN 4520-01-477-0568

EMERGENCY PROCEDURES UNDER UNUSUAL CONDITIONS

INITIAL SETUP:

Test Equipment
None

Tools and Special Tools
Fire extinguisher (item 6, WP 0058 00)

Personnel Required
One

References
WP 0005 00
WP 0006 00
FM 3-5

References – Continued
FM 10-67-1
TM 3-4240-338-12&P

Materials/Parts
Interface device adapter assembly (chemical and biological protection kit) (table 1, WP 0060 00)
Lockwasher (item 28, WP 0062 00)

Equipment Condition
None

NBC DECONTAMINATION PROCEDURES

The following procedures must be followed until field Nuclear, Biological, and Chemical (NBC) Decontamination Facilities are available. Assigned operators will assist the supporting NBC unit.

WARNING

If an NBC attack has occurred, do not use Chemical and Biological Protection Kit (CBPK) equipment until all items have been decontaminated. Refer to FM 3-5, NBC Decontamination, for detailed decontamination procedures.

1. If NBC attack is known or suspected, immediately put on mask and proceed as follows:

2. If ASH is operating with either fresh air damper assembly open or return air hose assembly removed, stop operation and proceed as follows:

   a. Notify your supervisor and personnel in shelter connected to ASH.

   b. Do not disconnect ASH.

   c. Close or cover all openings.

   d. Have decontamination performed on ASH.

   e. Operate ASH per Operation Under Usual Conditions procedures (WP 0005 00) with supply and return air hose assemblies attached and fresh air damper assembly closed.

NBC DECONTAMINATION PROCEDURES – Continued

3. If ASH is operating with fresh air damper assembly closed and supply and return air hose assemblies attached, continue operation and proceed as follows:

   a. Do not open any doors or panels.

   b. Have decontamination performed on ASH.

CBPK PROCEDURES

The following procedures must be followed whenever the threat of a nuclear, biological, or chemical attack is known or suspected.

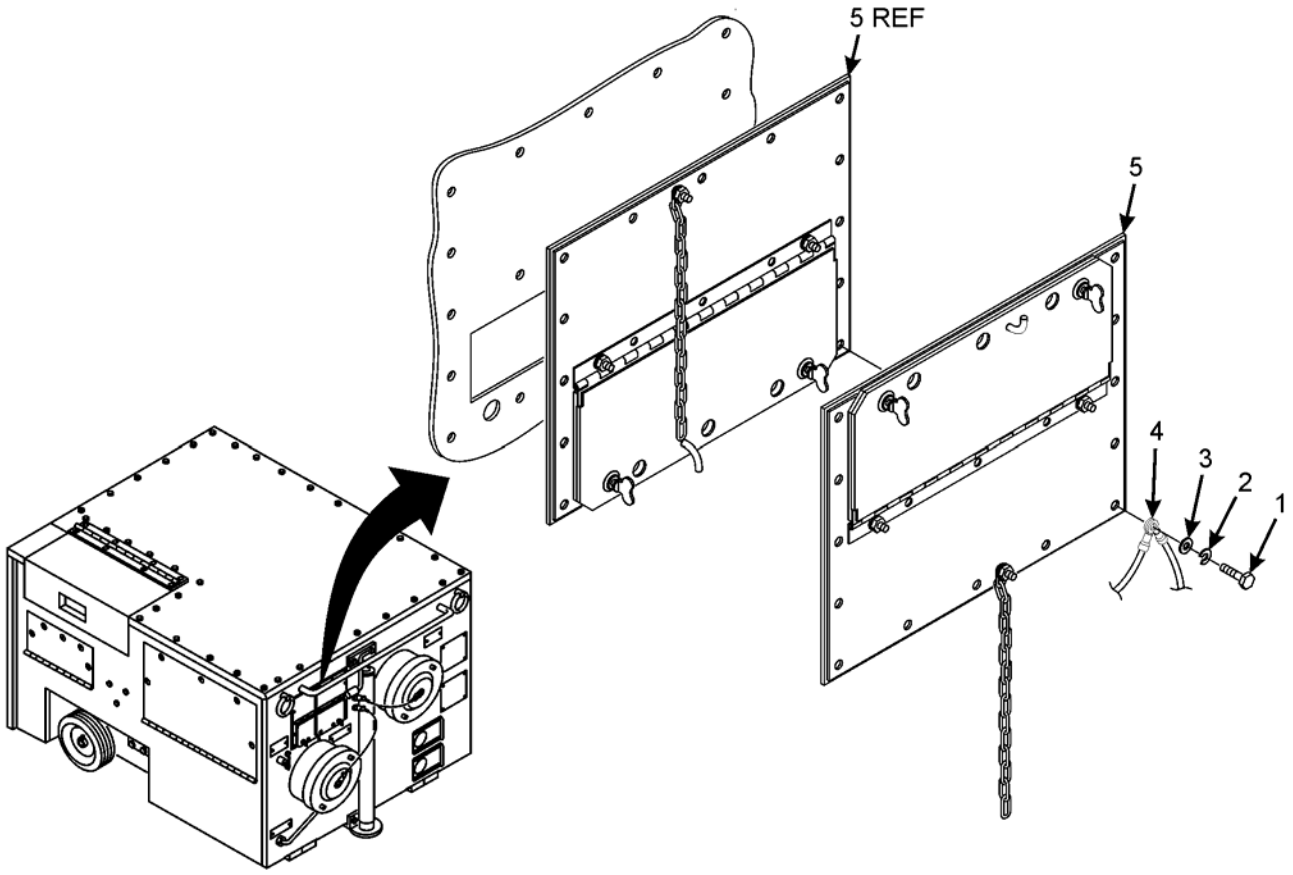
WARNING

If an NBC attack has occurred, do not use CBPK equipment until all items have been decontaminated. Refer to FM 3-5, NBC Decontamination, for detailed decontamination procedures.

Installation

1. Remove 19 screws (1), lockwashers (2), washers (3), two lanyards (4), and fresh air damper assembly (5).

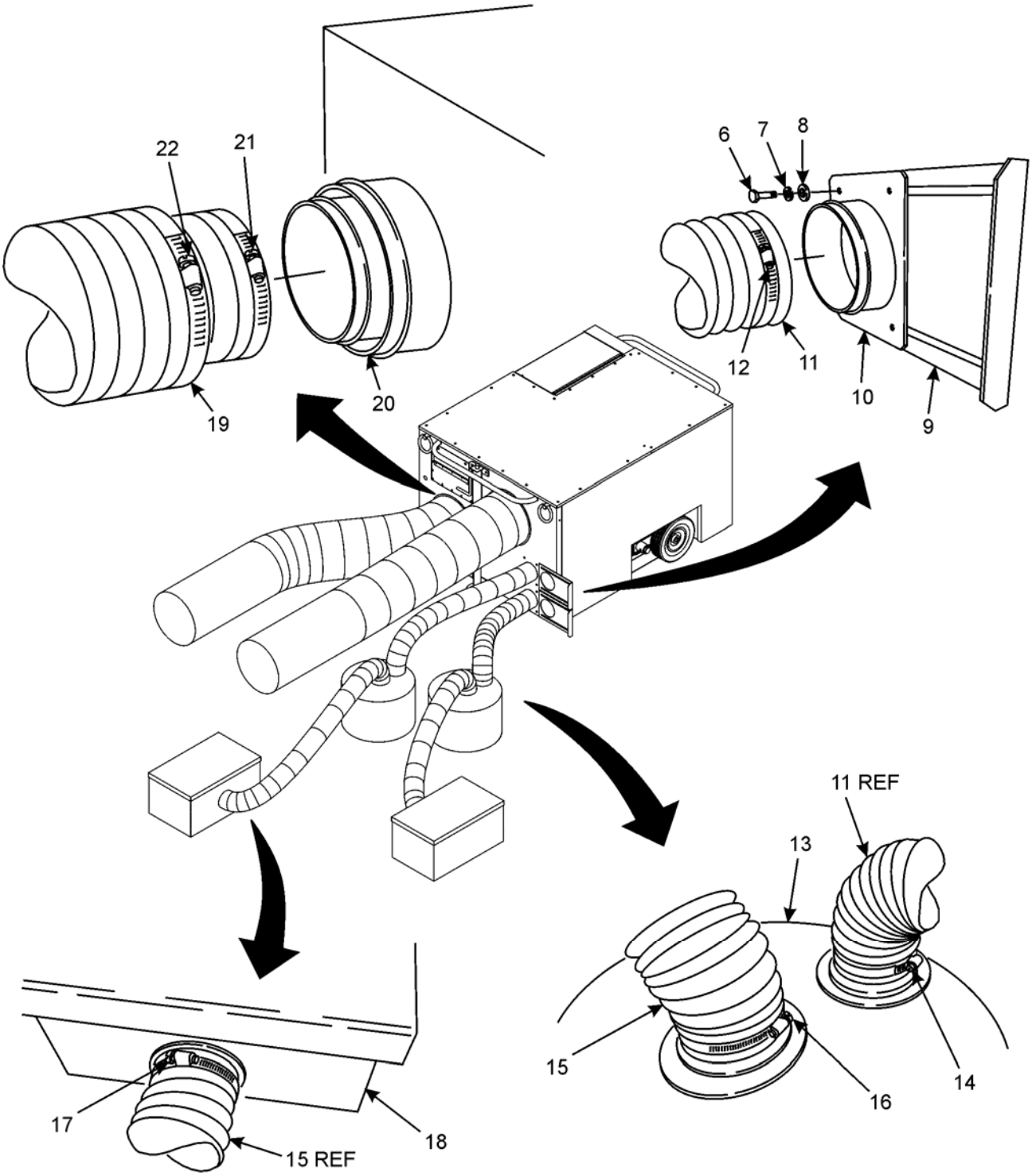
2. Rotate fresh air damper assembly (5) 180 degrees (3200 mils) (chain attachment screw down) and install fresh air damper assembly, two lanyards (4), 19 washers (3), lockwashers (2), and screws (1).



CBPK PROCEDURES – Continued

3. Remove eight screws (6), lockwashers (7), and washers (8). Discard lockwashers.
4. Install two cover plates (9), two adapters (10), with eight washers (8), lockwashers (7), and screws (6). Do not tighten hardware. Slide cover plates to open position. Tighten hardware.
5. Install two CBPK hoses (11) and clamps (12) onto adapters (10).
6. Install remaining ends of CBPK hoses (11) and clamps (14) onto outlet ports of filter canisters (13).
7. Install two CBPK hoses (15) and clamps (16) onto inlet ports of filter canisters (13).
8. Install remaining ends of CBPK hoses (15) and clamps (17) onto blowers (18).
9. Install inner connection of return air hose assembly (19) onto return air duct (20) and tighten clamp (21).
10. Install outer connection of return air hose assembly (19) onto return air duct (20) and tighten clamp (22).
11. Operate CBPK equipment per TM 3-4240-338-12&P.
12. Operate ASH per Operation Under Unusual Conditions procedures (WP 0006 00).

CBPK PROCEDURES – Continued



CBPK PROCEDURES – Continued

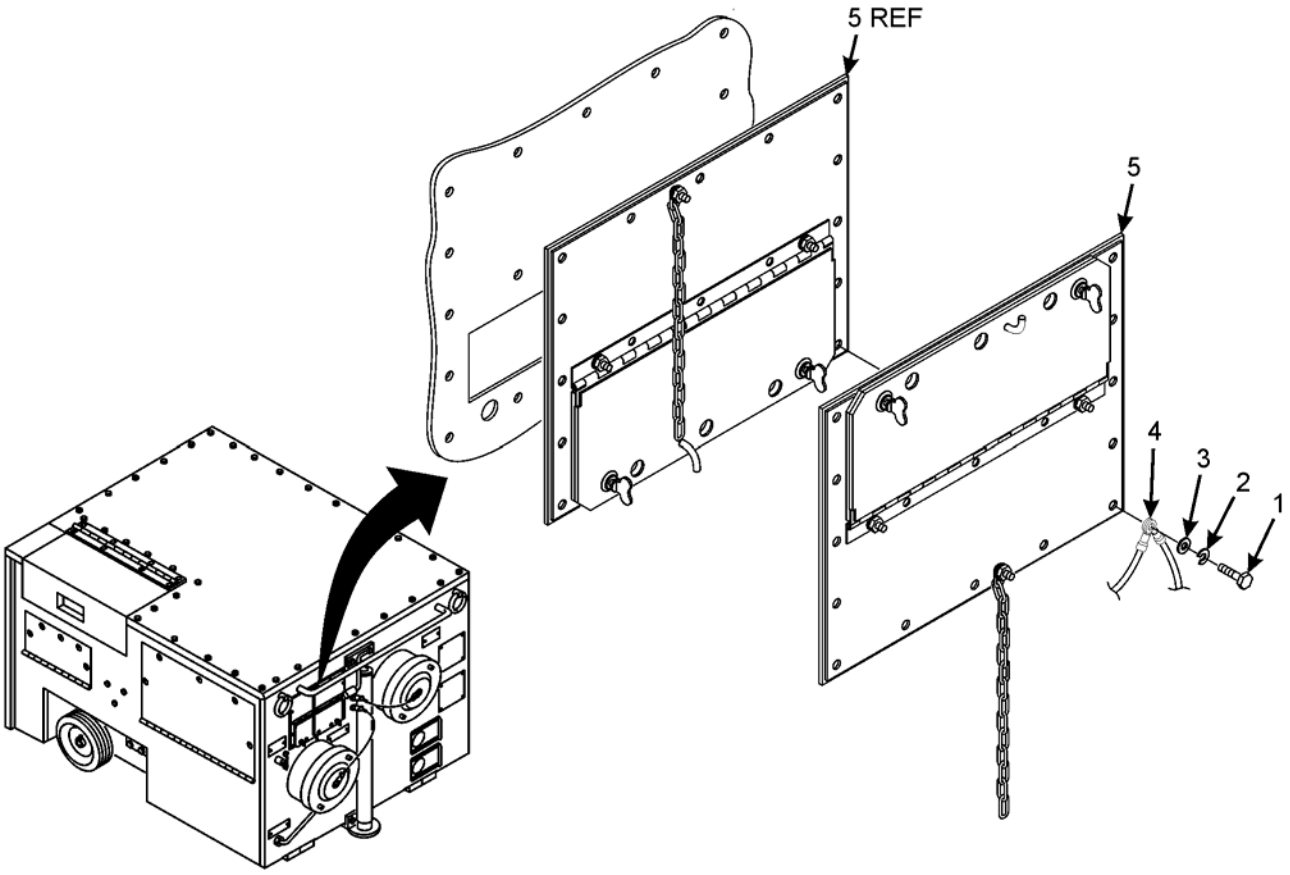
Removal

1. Loosen clamp (22) and pull outer connection of return air hose assembly (19) from return air duct (20) for access to inner connection of return air hose assembly.
2. Loosen clamp (21) and remove return air hose assembly (19) from return air duct (20).
3. Loosen two clamps (17) and remove CBPK hoses (15) from blowers (18).
4. Loosen two clamps (16) and remove CBPK hoses (15) from inlet ports of filter canisters (13).
5. Loosen two clamps (14) and remove CBPK hoses (11) from outlet ports of filter canisters (13).
6. Loosen two clamps (12) and remove CBPK hoses (11) from adapters (10).
7. Remove eight screws (6), lockwashers (7), washers (8), and adapters (10). Discard lockwashers.
8. Install two cover plates (9), eight washers (8), lockwashers (7), and screws (6). Do not tighten hardware. Slide cover plates to closed position. Tighten hardware.

CBPK PROCEDURES – Continued

9. Remove 19 screws (1), lockwashers (2), washers (3), two lanyards (4), and fresh air damper assembly (5).

10. Rotate fresh air damper assembly (5) 180 degrees (3200 mils) (chain attachment screw up) and install fresh air damper assembly, two lanyards (4), 19 washers (3), lockwashers (2), and screws (1).



FUEL SPILLS

The following procedures must be followed when operating in recirculating air setup, 100% fresh air setup, or on improved/unimproved surfaces.

WARNING

FOR FUEL SPILLS, REFER TO FM 10-67-1, CONCEPTS AND EQUIPMENT OF PETROLEUM OPERATIONS.

Fuel is flammable and toxic to eyes, skin, and respiratory tract. Skin/eye protection is required. Avoid repeated/prolonged contact. Use only in well-ventilated areas. Keep away from open flames or other sources of ignition. Post FUEL FLAMMABLE/NO SMOKING signs around the area. Be sure a fire extinguisher is available.

Fuel on clothing can be fatal if ignited by a static discharge. If fuel gets on clothes, leave the refueling area as soon as possible, remove clothes, and wash skin with warm, soapy water before getting dressed.

Spilled fuel creates a flammable, vapor-air mixture and fire can take place. Improper positioning of external fuel source can cause fuel tank to overflow. Stop refueling immediately if fuel spill occurs.

1. When operating in recirculating air setup, proceed as follows:
   a. Close fresh air damper assembly if open.
   b. Set control panel MODE SWITCH to VENT position and allow ASH to cool down for 2 minutes.
   c. Set control panel MODE SWITCH to OFF position to stop operation.
   d. Notify your supervisor.
   e. Clean up fuel spills per FM 10-67-1.
2. When operating in 100% fresh air setup, proceed as follows:
   a. Set control panel MODE SWITCH to OFF position to stop operation.
   b. Check shelter being serviced by ASH for any fuel odors. Evacuate area until shelter is ventilated and free of any fuel odors.
   c. Notify your supervisor.
   d. Clean up fuel spills per FM 10-67-1.
3. When operating on improved (hard) surfaces, call for wash-down truck to reduce rate of vaporization.
4. When operating on unimproved (soft) surfaces, cover areas with dry soil to reduce rate of vaporization.
5. Notify your supervisor.
6. If fuel gets on your clothes, leave the refueling area as soon as possible, remove clothes, and wash skin with warm, soapy water before getting dressed.

END OF WORK PACKAGE

OPERATOR INSTRUCTIONS

ARMY SPACE HEATER H-140

NSN 4520-01-477-0568

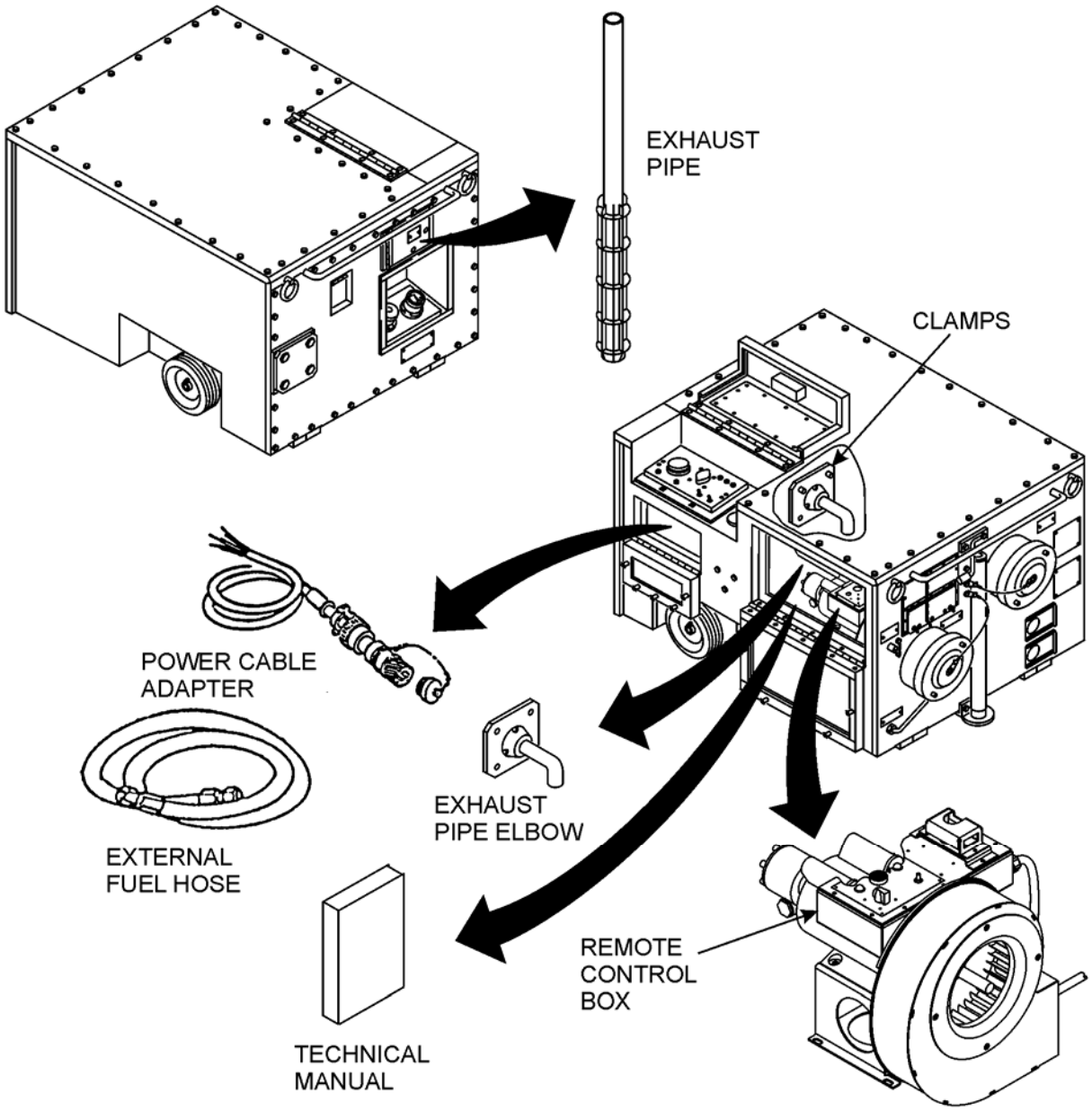
STOWAGE AND DECAL AND DATA PLATE GUIDE

INTRODUCTION

The Stowage and Decal and Data Plate Guide illustrates the locations for equipment stowage and decals and data plates. Detailed information on each decal/data plate is also provided. Also shown are the locations of stencils that contain warnings or information required to safely operate the ASH.

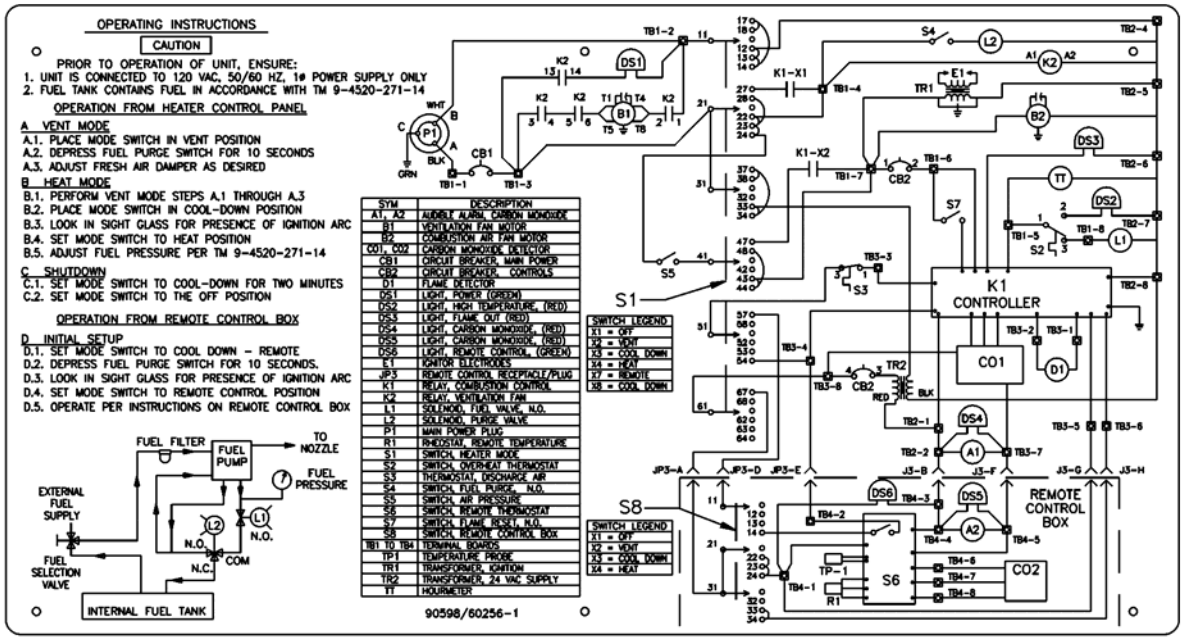
STOWAGE LOCATIONS

Stowage locations for ASH equipment are shown in the following illustration. Specific requirements for each item are also shown.

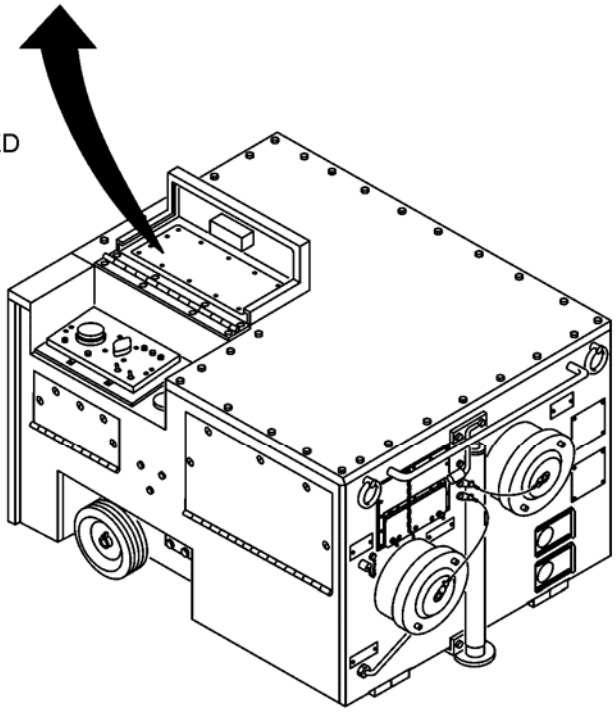


DECALS AND DATA PLATES

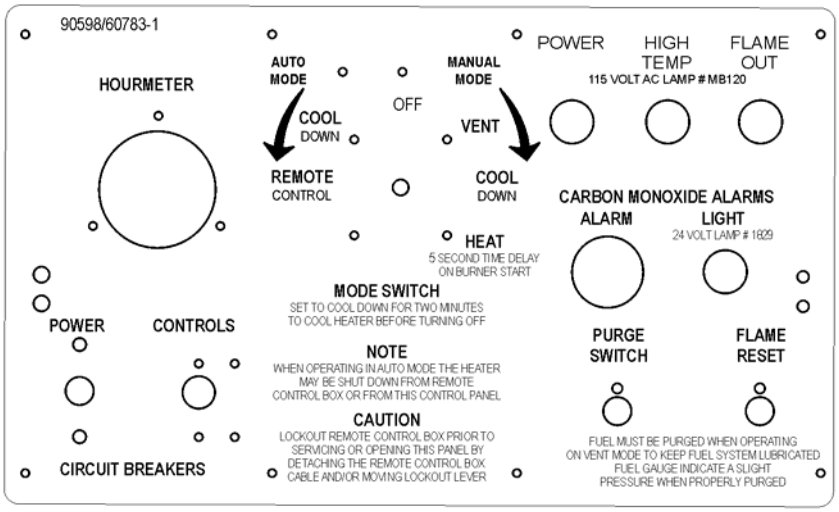
Decals and data plates used on the ASH are shown in following illustrations.

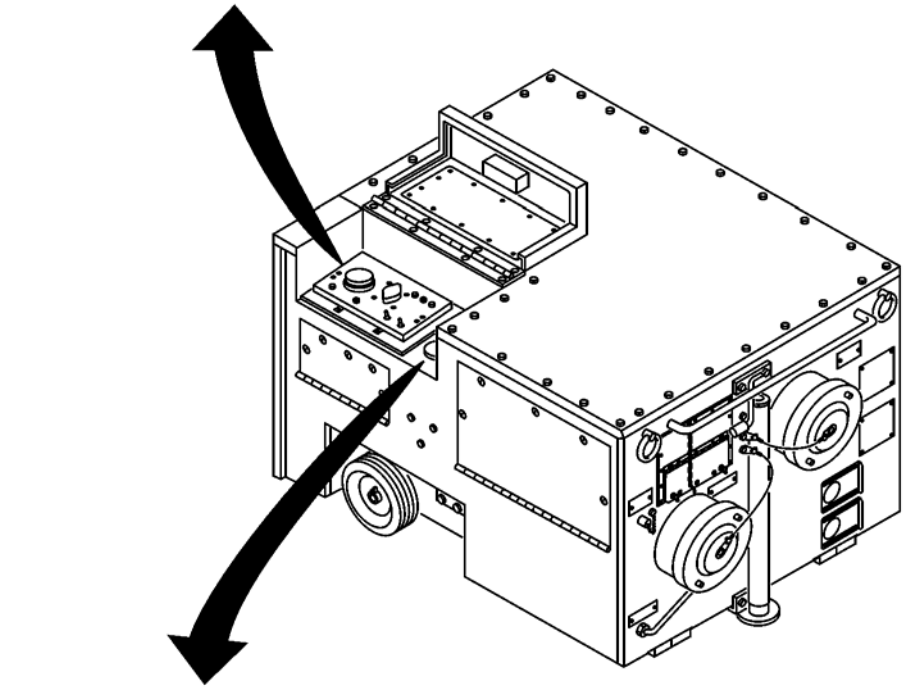


NOTE: SEE FIGURE FO-2 FOR AN ENLARGED CLEAR VIEW OF THE INSTRUCTIONS.

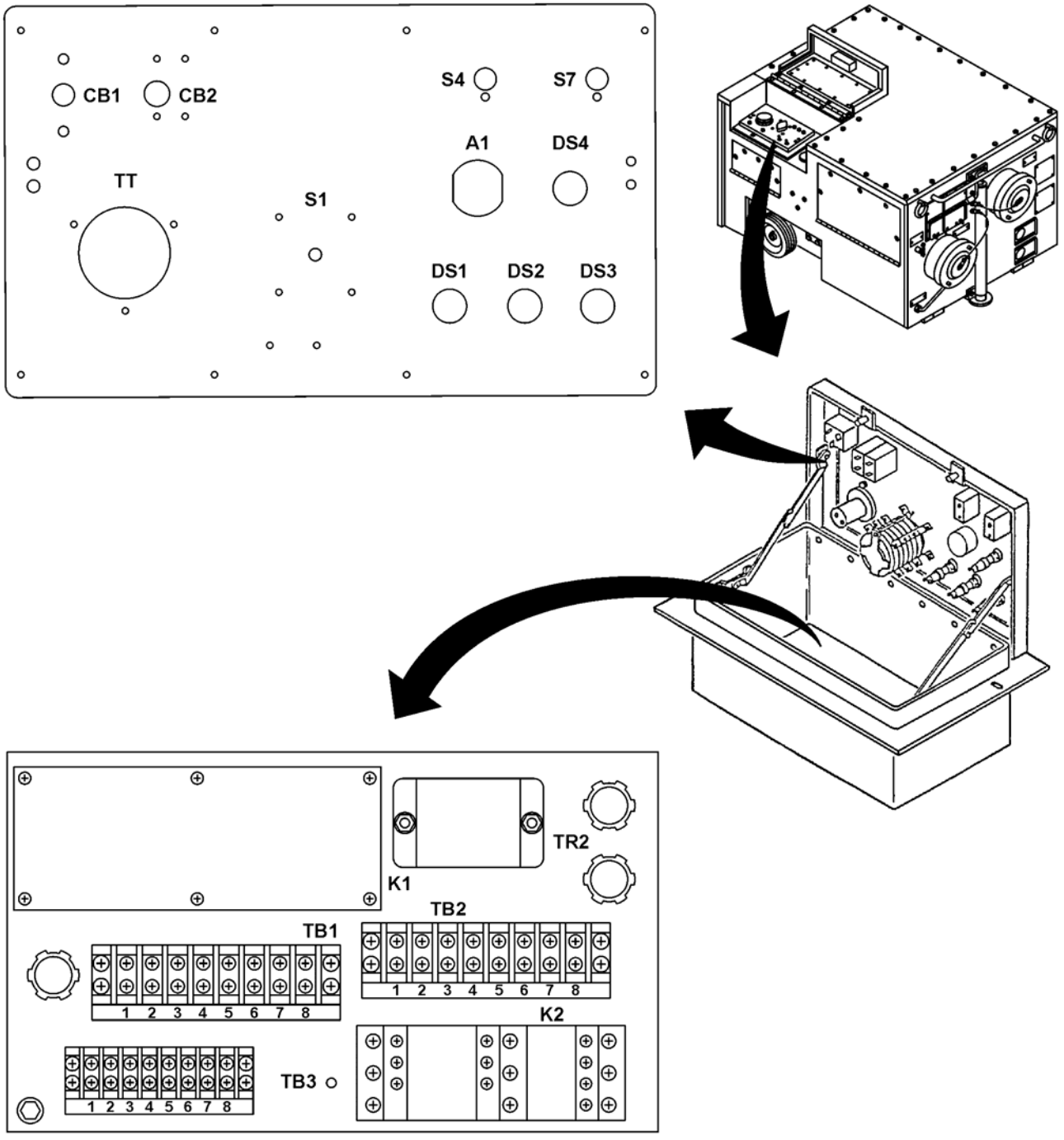


DECALS AND DATA PLATES – Continued

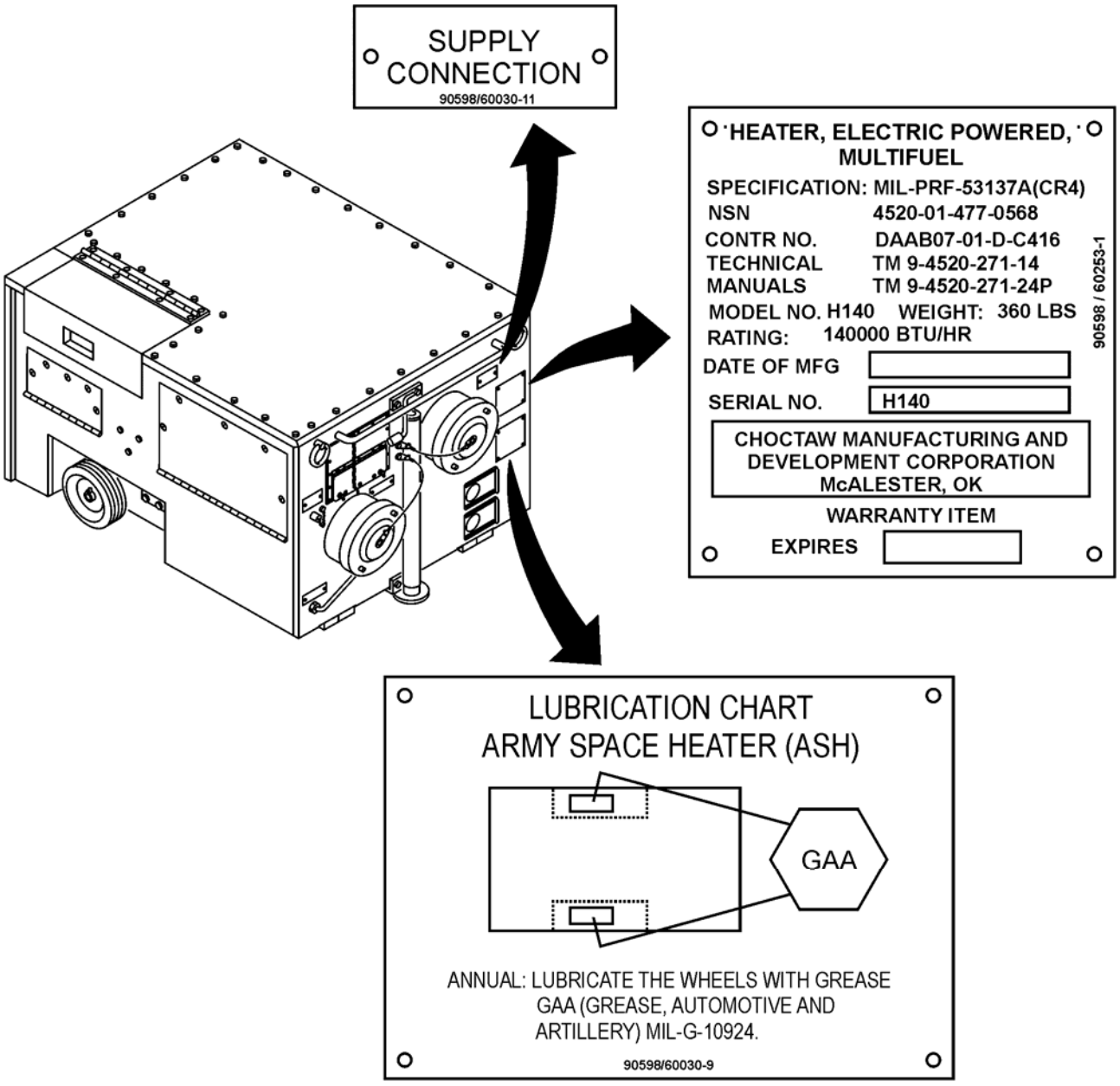




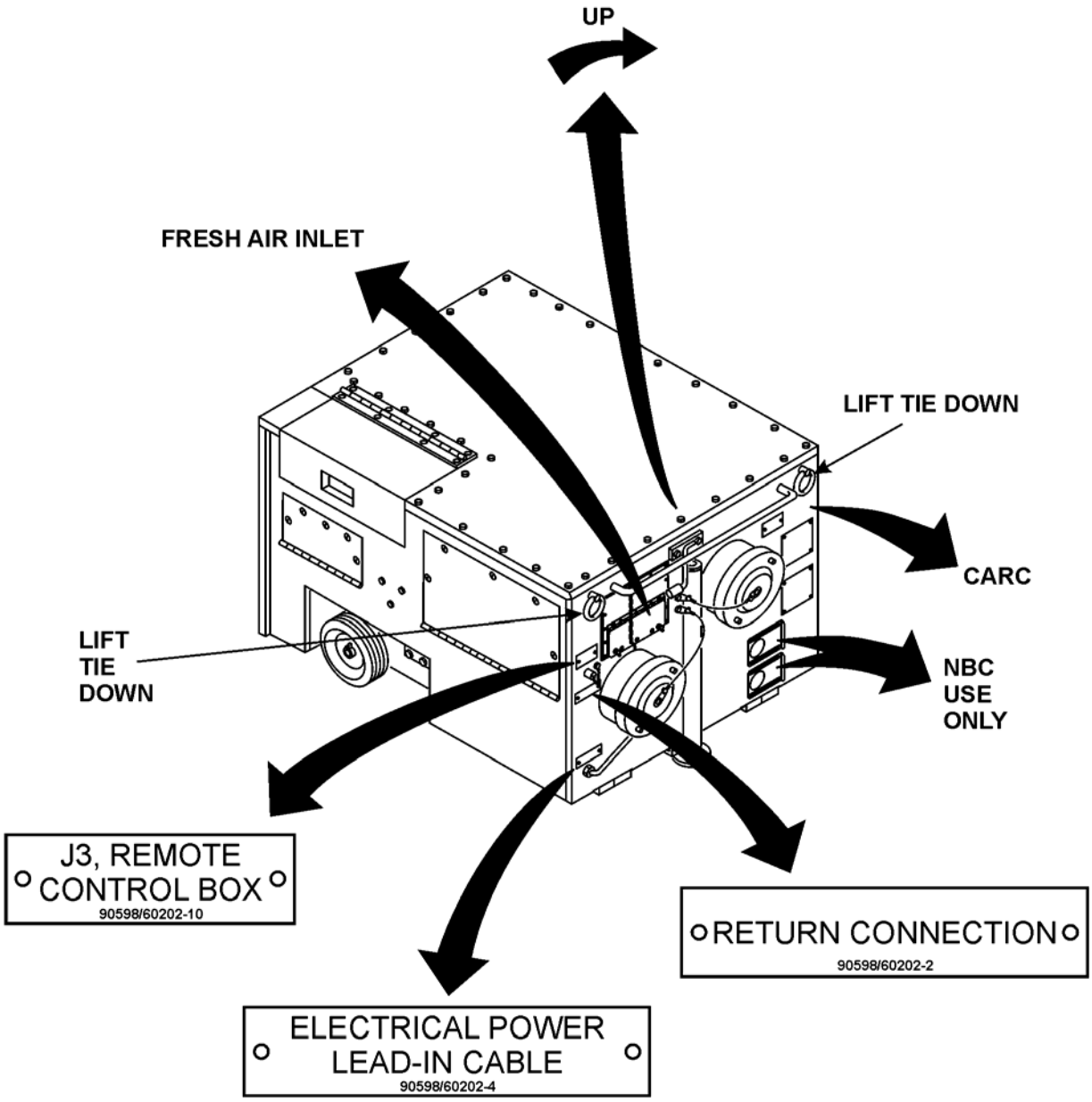
DECALS AND DATA PLATES – Continued



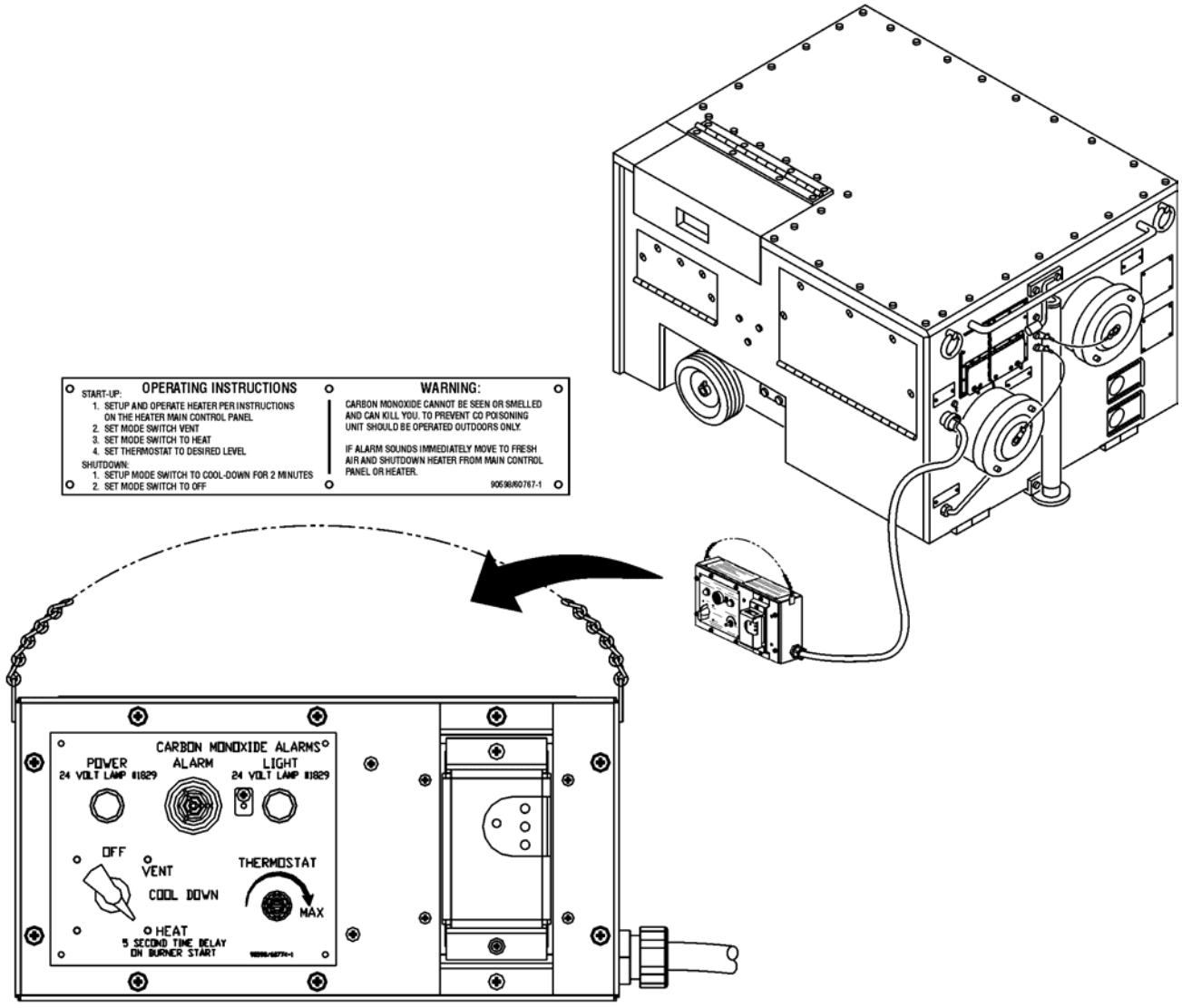
DECALS AND DATA PLATES – Continued



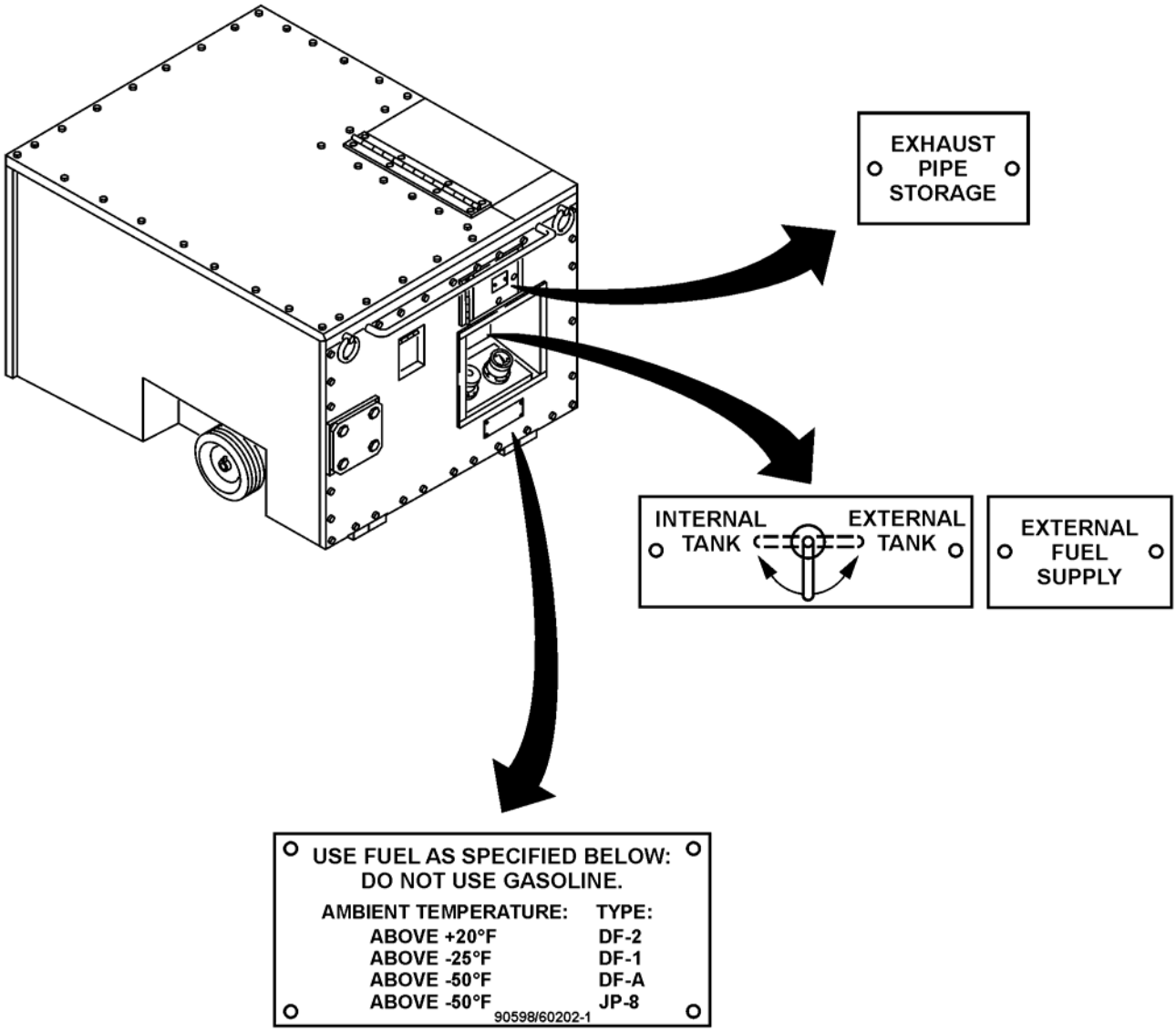
DECALS AND DATA PLATES – Continued



DECALS AND DATA PLATES – Continued



DECALS AND DATA PLATES – Continued



END OF WORK PACKAGE

CHAPTER 3

OPERATOR TROUBLESHOOTING PROCEDURES FOR ARMY SPACE HEATER H-140

OPERATOR TROUBLESHOOTING PROCEDURES

ARMY SPACE HEATER H-140

NSN 4520-01-477-0568

TROUBLESHOOTING INDEX

INTRODUCTION

The Troubleshooting Index contains a quick reference by work package and page number for the Operational Checkout and Troubleshooting Procedures work package (WP 0010 00). The Troubleshooting Procedures work package (WP 0010 00) identifies malfunctions and corrective actions to return the ASH to normal operation. Any malfunction requiring repair beyond the scope of the operator should be referred to unit maintenance.

Malfunction/Symptom	Troubleshooting Procedure Page No.
1. Ventilation Air Fan Does Not Start	0010 00-3
2. No Combustion in HEAT MANUAL MODE	0010 00-4
3. No Combustion in HEAT AUTO MODE	0010 00-8
4. Ventilation Air Fan Slows Down or Indicator Lights Dim	0010 00-9
5. ASH Flames Out Repeatedly (More Than Three Times)	0010 00-10
6. Fuel Pressure Gage Indicates 25 Psi (172 kPa) or Less in HEAT MANUAL MODE or HEAT AUTO MODE	0010 00-12
7. Ventilation Air Fan Operates but Fuel Pressure Gage Indicates 0 Psi (0 kPa)	0010 00-14
8. Excessive Black Smoke in Exhaust	0010 00-15
9. CARBON MONOXIDE ALARMS Sound and Light	0010 00-16

OPERATOR TROUBLESHOOTING PROCEDURES

ARMY SPACE HEATER H-140

NSN 4520-01-477-0568

OPERATIONAL CHECKOUT AND TROUBLESHOOTING PROCEDURES

INITIAL SETUP:

Test Equipment
None

Tools and Special Tools
None

Personnel Required
One

References
WP 0002 00, table 3
WP 0005 00
FM 4-25.11
FM 10-67-1

Materials/Parts
None

Equipment Condition
None

WARNING

Heat exchanger overheating may damage the ASH and under some conditions a safety hazard may result. An overheat shutdown occurs when the combustion air and ventilation air fan assemblies are turned off at the same time when in the heating modes. Always set the control panel MODE SWITCH to the VENT position for at least 2 minutes when shutting down the ASH from the heating modes.

Contact with hot components can cause burns. Allow ASH to cool down before attempting service, inspection, or maintenance activity.

FOR FUEL SPILLS, REFER TO FM 10-67-1, CONCEPTS AND EQUIPMENT OF PETROLEUM OPERATIONS.

Fuel is flammable and toxic to eyes, skin, and respiratory tract. Skin/eye protection is required. Avoid repeated/prolonged contact. Use only in well-ventilated areas. Keep away from open flames or other sources of ignition. Post FUEL FLAMMABLE/NO SMOKING signs around the area. Be sure a fire extinguisher is available.

Fuel on clothing can be fatal if ignited by a static discharge. If fuel gets on clothes, leave the refueling area as soon as possible, remove clothes, and wash skin with warm, soapy water before getting dressed.

Spilled fuel creates a flammable, vapor-air mixture and fire can take place. Improper positioning of external fuel source can cause fuel tank to overflow. Stop refueling immediately if fuel spill occurs.

INITIAL SETUP – Continued:

WARNING

FOR ARTIFICIAL RESPIRATION, REFER TO FM 4-25.11, FIRST AID.

Electrical high voltage cannot be seen but can kill you. Electricity is unlike most other dangerous things you can come in contact with because it gives no warning and no symptoms to be wary of. Its effect is immediate. It can kill you, render you unconscious, or severely burn you.

To ensure your safety and that of other maintenance personnel, always observe the following precautions:

DO NOT perform any maintenance on electrical equipment unless all power is removed.

BE CERTAIN that there is someone assisting you who can remove power immediately.

CAUTION

The INTERNAL TANK/EXTERNAL TANK selector valve must be fully positioned to either setting. Any selector valve setting between INTERNAL TANK and EXTERNAL TANK may result in fuel starvation and damage to the fuel pump.

INTRODUCTION

The Operational Checkout and Troubleshooting Procedures contain fault trees that identify the malfunctions, tests or inspections, and corrective actions required to return the ASH to normal operation. The tests/inspections and corrective actions should be performed in the order listed. The operator troubleshooting procedures cannot list all possible malfunctions or tests and inspections required for corrective action. If a malfunction is not listed or is not corrected by the listed corrective action, notify unit maintenance.

TROUBLESHOOTING PROCEDURES

Malfunction 1. Ventilation Air Fan Does Not Start

IS POWER CABLE PROPERLY CONNECTED TO POWER SOURCE?

NO → CONNECT POWER CABLE (WP 0005 00).

YES

IS POWER SOURCE OPERATING PROPERLY?

NO → NOTIFY UNIT MAINTENANCE.

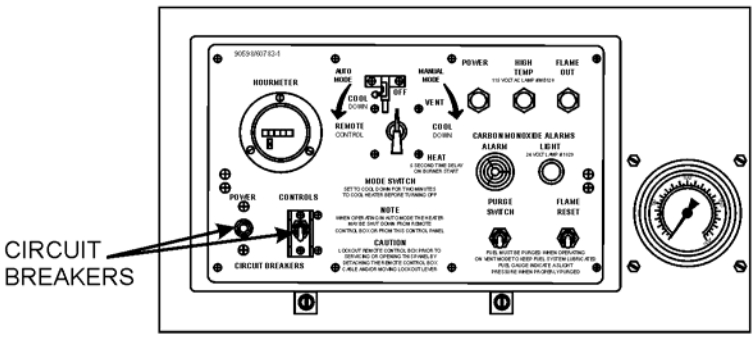
YES

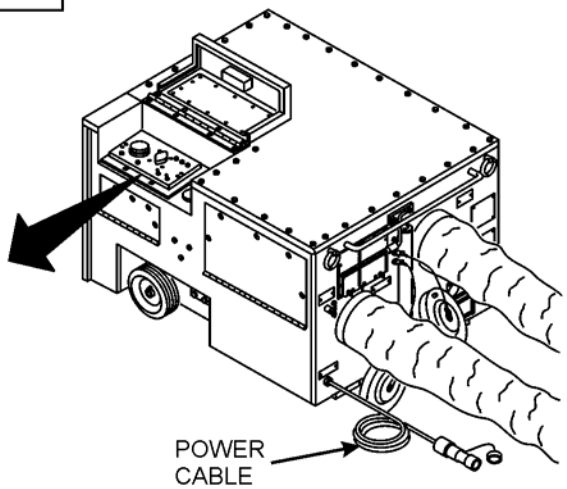
IS CONTROL PANEL POWER CIRCUIT BREAKER CB1 SET OR CONTROLS CIRCUIT BREAKER CB2 POSITIONED TO UP?

NO → RESET CIRCUIT BREAKER CB1 OR CB2.

YES

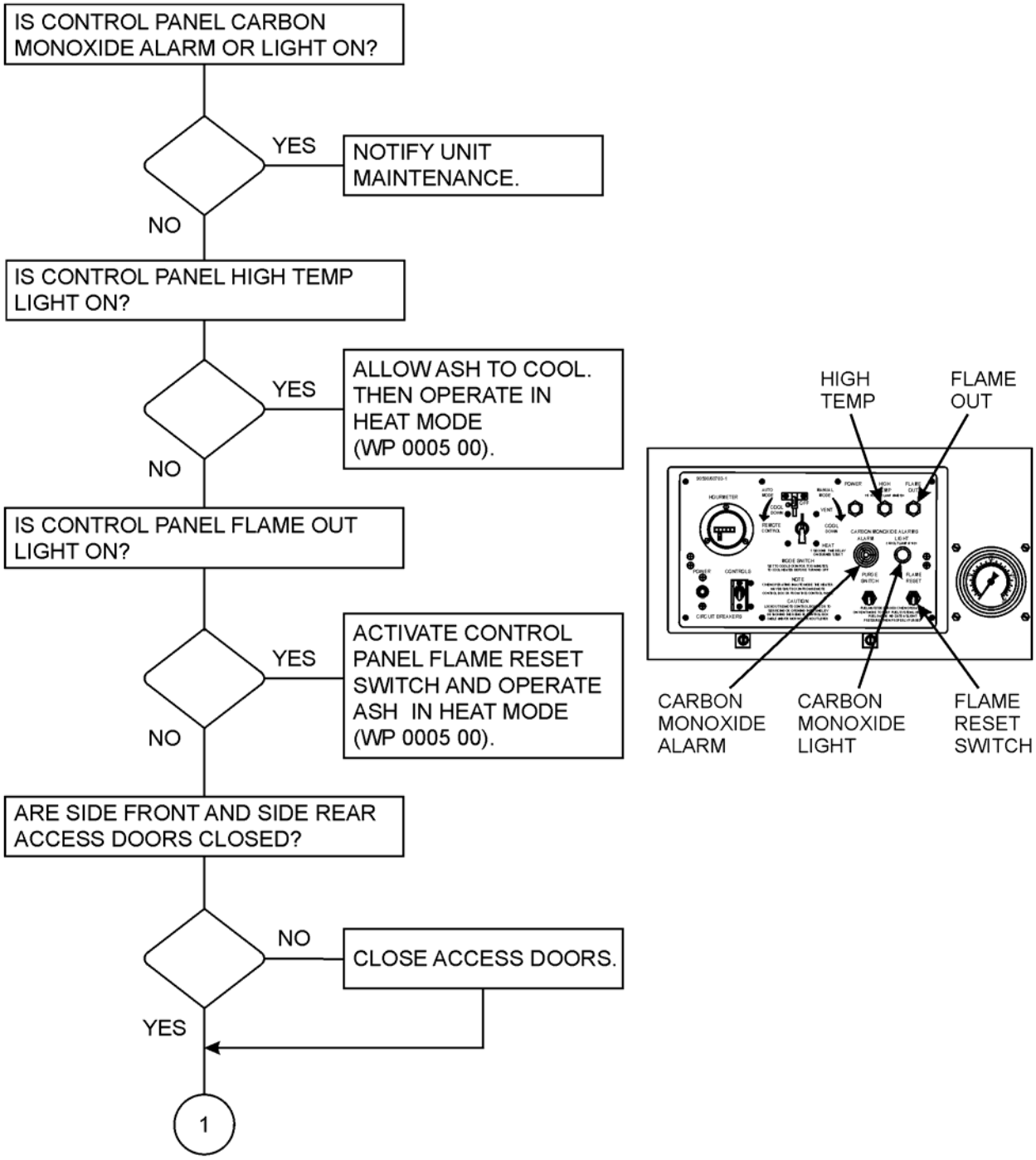
NOTIFY UNIT MAINTENANCE.





TROUBLESHOOTING PROCEDURES – Continued

Malfunction 2. No Combustion in HEAT MANUAL MODE



TROUBLESHOOTING PROCEDURES – Continued

Malfunction 2. No Combustion in HEAT MANUAL MODE – Continued

1

ARE CONTROL PANEL POWER CIRCUIT BREAKER CB1 AND CONTROLS CIRCUIT BREAKER CB2 SET?

NO → RESET CIRCUIT BREAKERS CB1 AND CB2.

YES

CHECK FUEL LEVEL OF INTERNAL TANK OR EXTERNAL TANK. IS THERE ENOUGH FUEL TO OPERATE?

NO → ADD FUEL (WP 0005 00).

YES

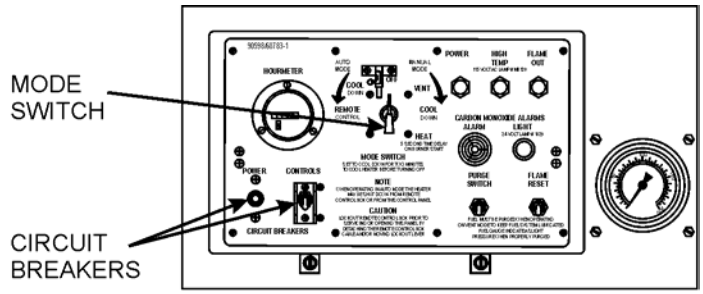
IS FUEL VALVE HANDLE SET FULLY TO INTERNAL TANK OR EXTERNAL TANK?

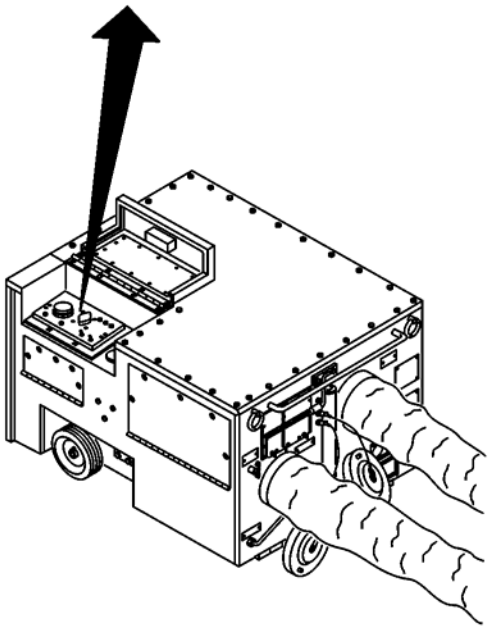
NO → ADJUST FUEL VALVE HANDLE FULLY TO INTERNAL TANK OR EXTERNAL TANK.

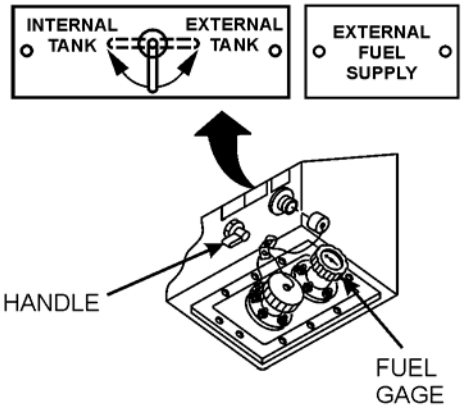
YES

SET CONTROL PANEL MODE SWITCH S1 TO COOL DOWN.

2







TROUBLESHOOTING PROCEDURES – Continued

Malfunction 2. No Combustion in HEAT MANUAL MODE – Continued

2

IS SIGHT GLASS CLEAR?

NO → NOTIFY UNIT MAINTENANCE.

YES

IS IGNITION VISIBLE THROUGH SIGHT GLASS?

NO → NOTIFY UNIT MAINTENANCE.

YES

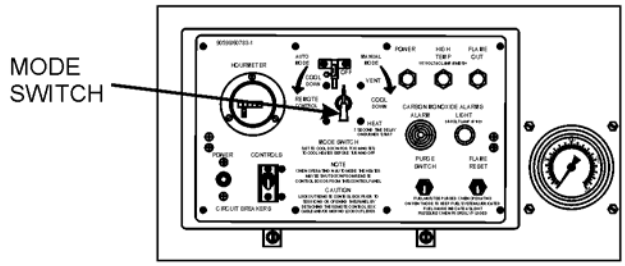
DO SUPPLY OR RETURN DUCT AIR SCREENS OR HOSES HAVE OBSTRUCTIONS OR SHARP BENDS THAT MAY RESTRICT AIRFLOW?

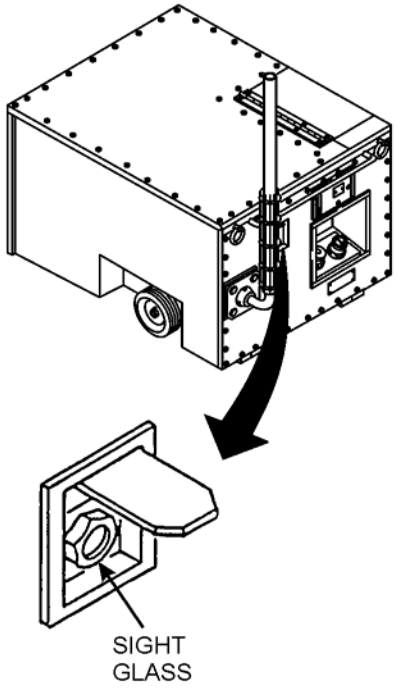
YES → REMOVE OBSTRUCTIONS AND STRAIGHTEN SHARP BENDS. IF TORN OR DAMAGED, NOTIFY UNIT MAINTENANCE.

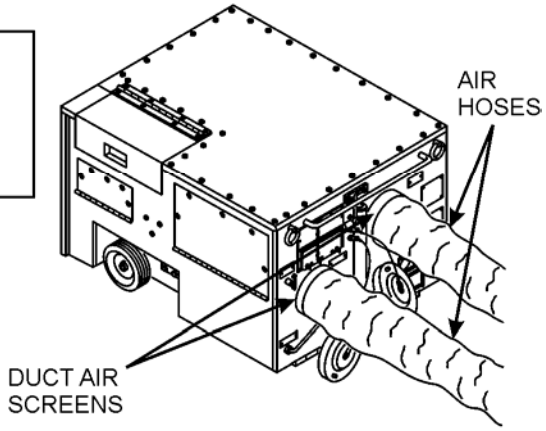
NO

SET CONTROL PANEL MODE SWITCH TO HEAT.

3

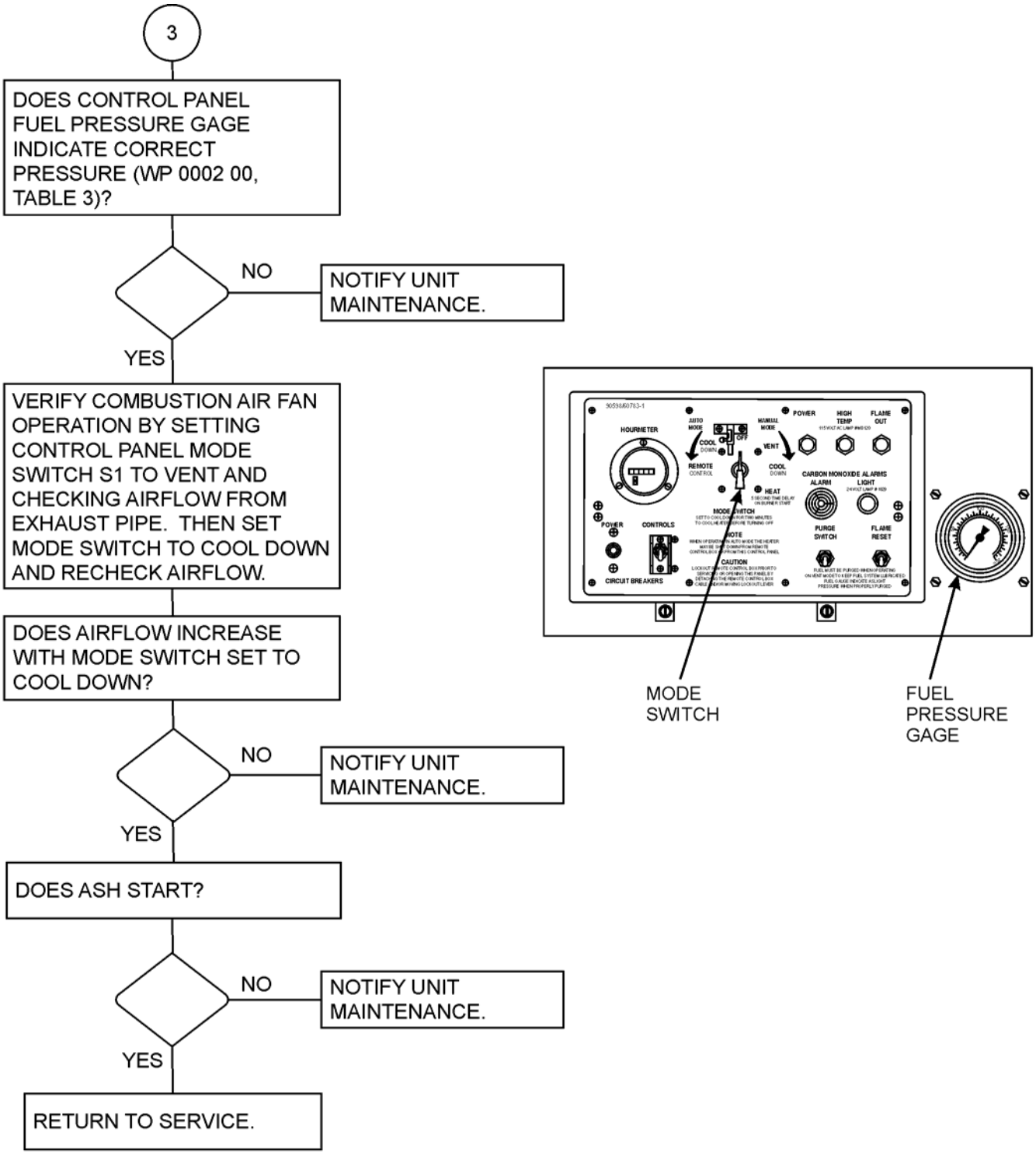






TROUBLESHOOTING PROCEDURES – Continued

Malfunction 2. No Combustion in HEAT MANUAL MODE – Continued



TROUBLESHOOTING PROCEDURES – Continued

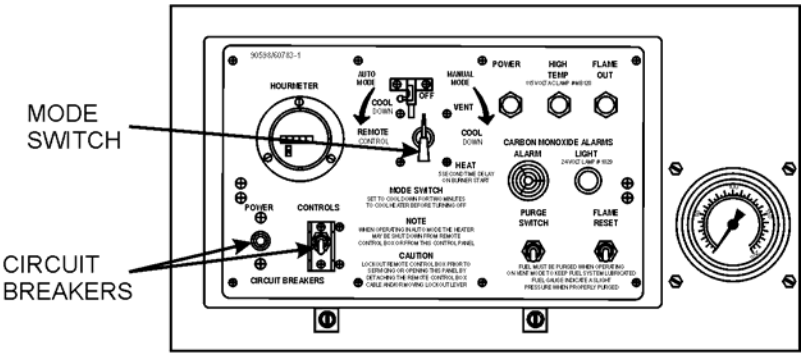
Malfunction 3. No Combustion in HEAT AUTO MODE

DOES ASH START WITH CONTROL PANEL MODE SWITCH SET TO MANUAL HEAT?

NO → TROUBLESHOOT USING MALFUNCTION 2.

YES

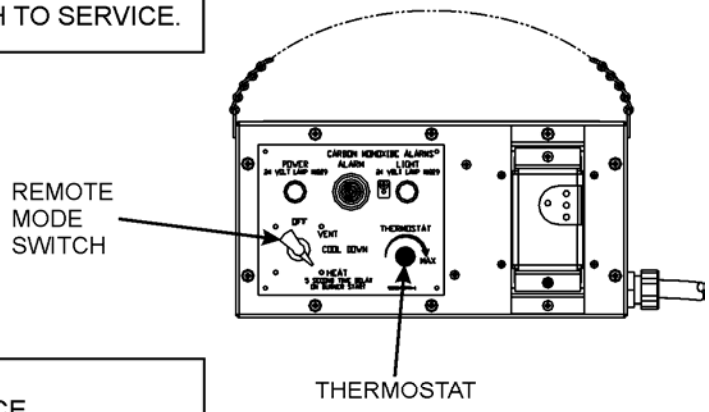
SET CONTROL PANEL MODE SWITCH TO REMOTE CONTROL. SET REMOTE CONTROL PANEL MODE SWITCH TO HEAT. DOES ASH START?



YES → RETURN ASH TO SERVICE.

NO

SET REMOTE CONTROL PANEL THERMOSTAT CONTROL TO MAX. DOES ASH START?



NO → NOTIFY UNIT MAINTENANCE.

YES

ADJUST REMOTE CONTROL PANEL THERMOSTAT AS REQUIRED AND RETURN ASH TO SERVICE.

TROUBLESHOOTING PROCEDURES – Continued

Malfunction 4. Ventilation Air Fan Slows Down or Indicator Lights Dim

CHECK FOR LOOSE POWER CABLE CONNECTION.

YES → CONNECT LOOSE POWER CABLE (WP 0005 00).

NO

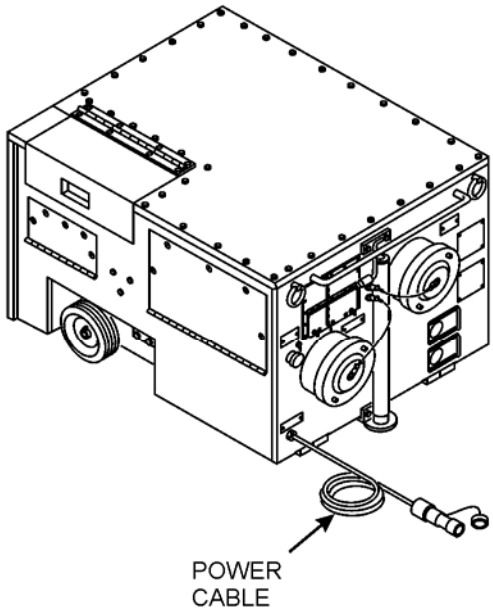
IS POWER SOURCE OPERATING PROPERLY?

NO → NOTIFY UNIT MAINTENANCE.

YES

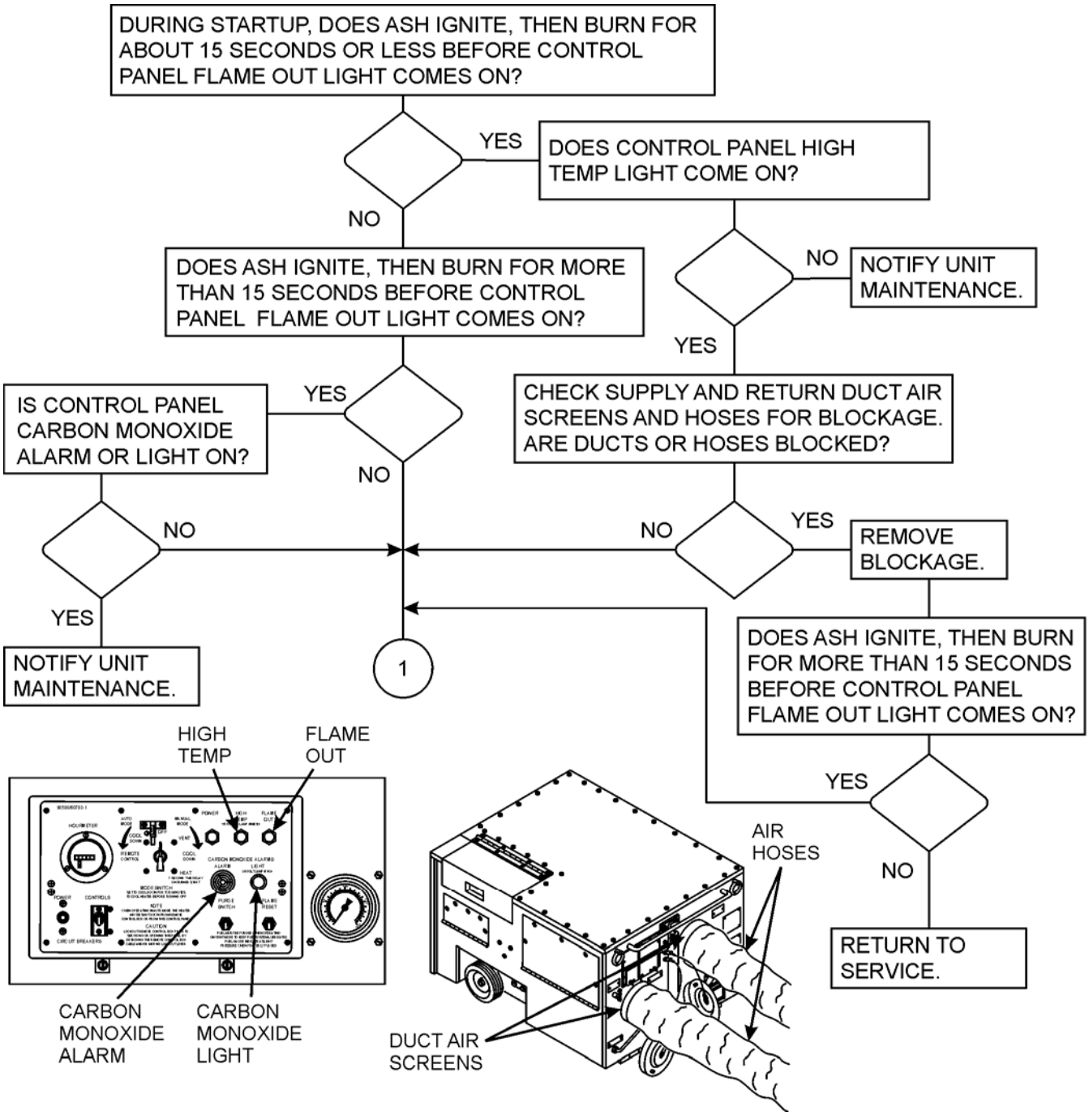
INSPECT POWER CABLE FOR CUTS, BURNED INSULATION, AND DAMAGED CONNECTOR.

NOTIFY UNIT MAINTENANCE.



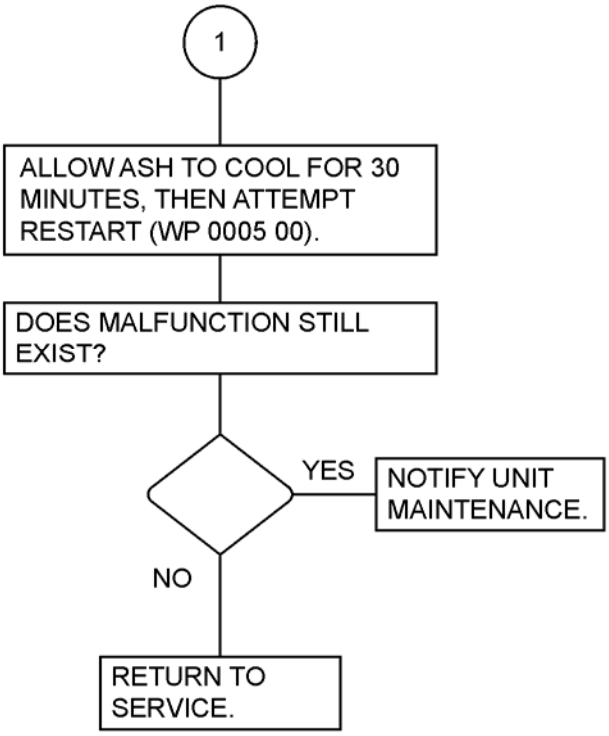
TROUBLESHOOTING PROCEDURES – Continued

Malfunction 5. ASH Flames Out Repeatedly (More Than Three Times)



TROUBLESHOOTING PROCEDURES – Continued

Malfunction 5. ASH Flames Out Repeatedly (More Than Three Times) – Continued



TROUBLESHOOTING PROCEDURES – Continued

Malfunction 6. Fuel Pressure Gage Indicates 25 Psi (172 kPa) or Less in HEAT MANUAL MODE or HEAT AUTO MODE

IS CONTROL PANEL FLAME OUT LIGHT ON?

YES → ACTIVATE CONTROL PANEL FLAME RESET SWITCH AND OPERATE ASH IN HEAT MODE (WP 0005 00).

NO

CHECK FUEL LEVEL OF INTERNAL TANK OR EXTERNAL TANK. IS THERE ENOUGH FUEL TO OPERATE?

NO → ADD FUEL (WP 0005 00).

YES

IS FUEL VALVE HANDLE SET BETWEEN INTERNAL TANK AND EXTERNAL TANK? (VALVE HANDLE MUST BE SET COMPLETELY TO STOP.)

NO → SET FUEL VALVE HANDLE FULLY TO INTERNAL TANK OR EXTERNAL TANK.

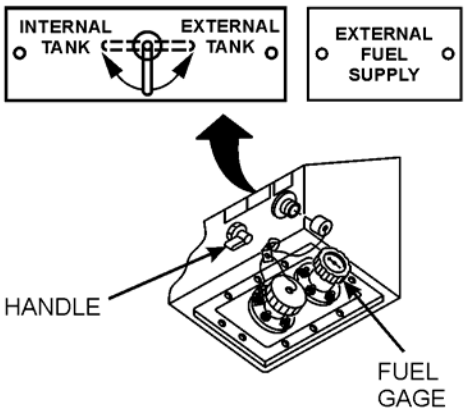
YES

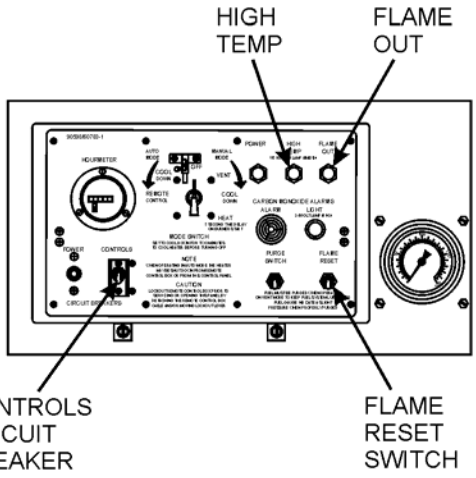
IS CONTROL PANEL CONTROLS CIRCUIT BREAKER CB2 ON?

NO → SET CONTROLS CIRCUIT BREAKER CB2 TO ON.

YES

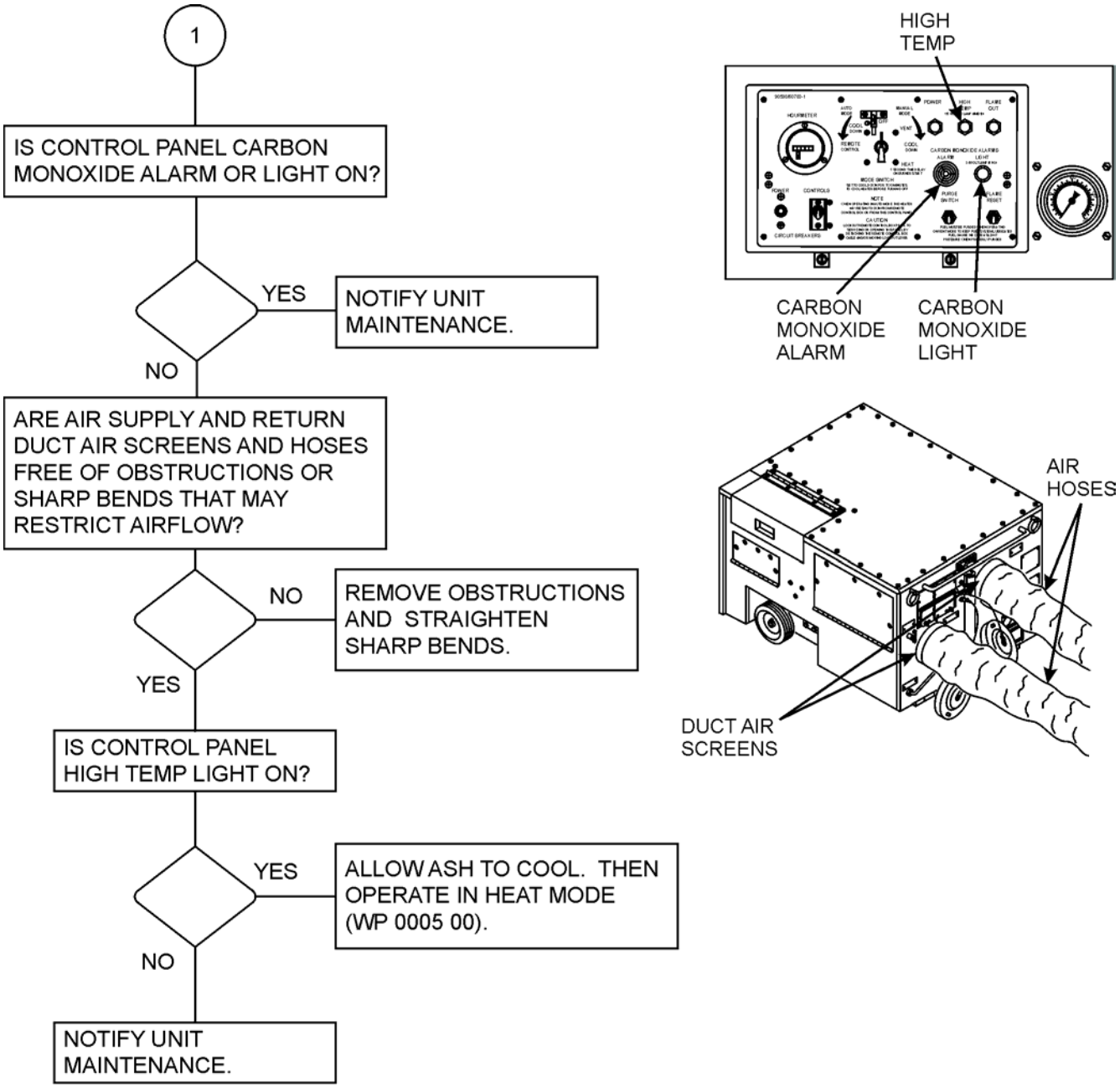
1





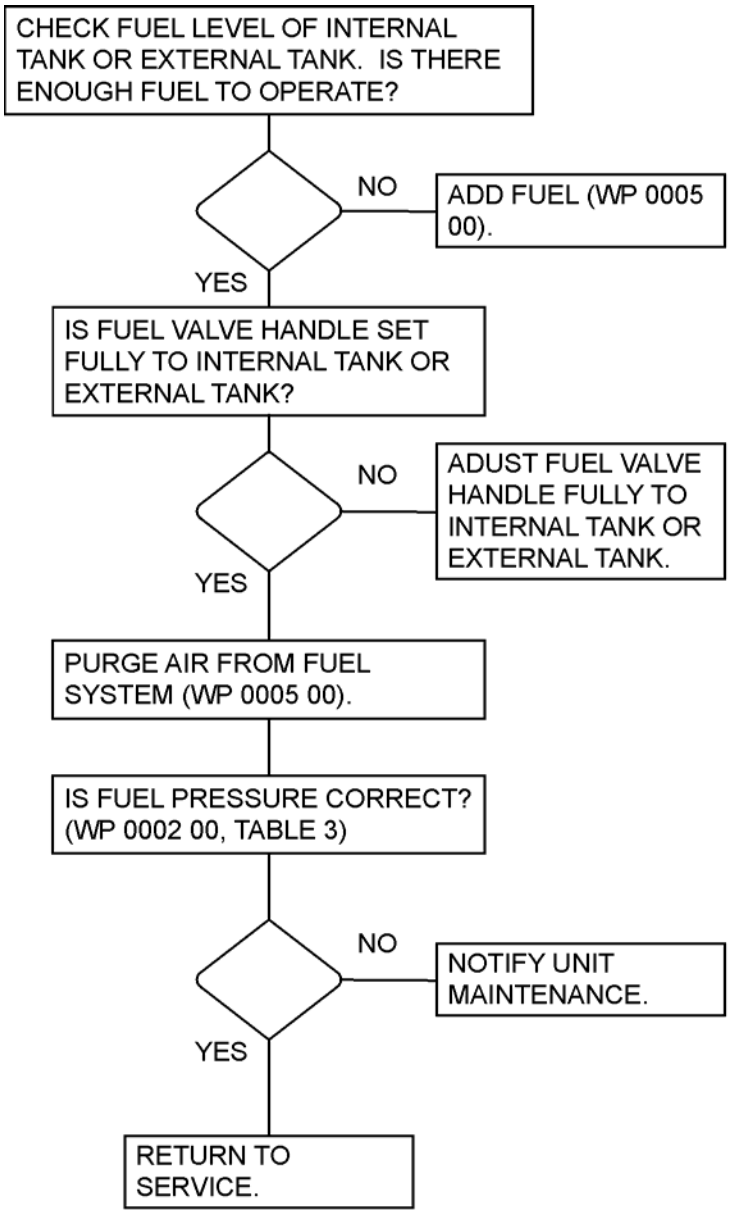
TROUBLESHOOTING PROCEDURES – Continued

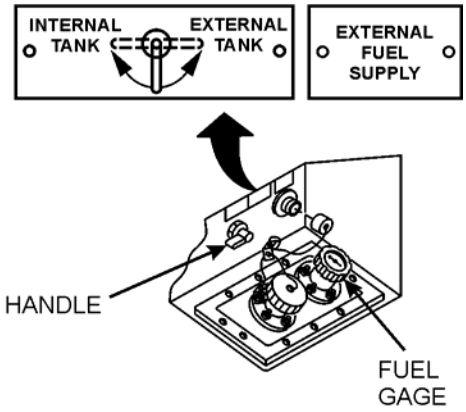
Malfunction 6. Fuel Pressure Gage Indicates 25 Psi (172 kPa) or Less in HEAT MANUAL MODE or HEAT AUTO MODE – Continued



TROUBLESHOOTING PROCEDURES – Continued

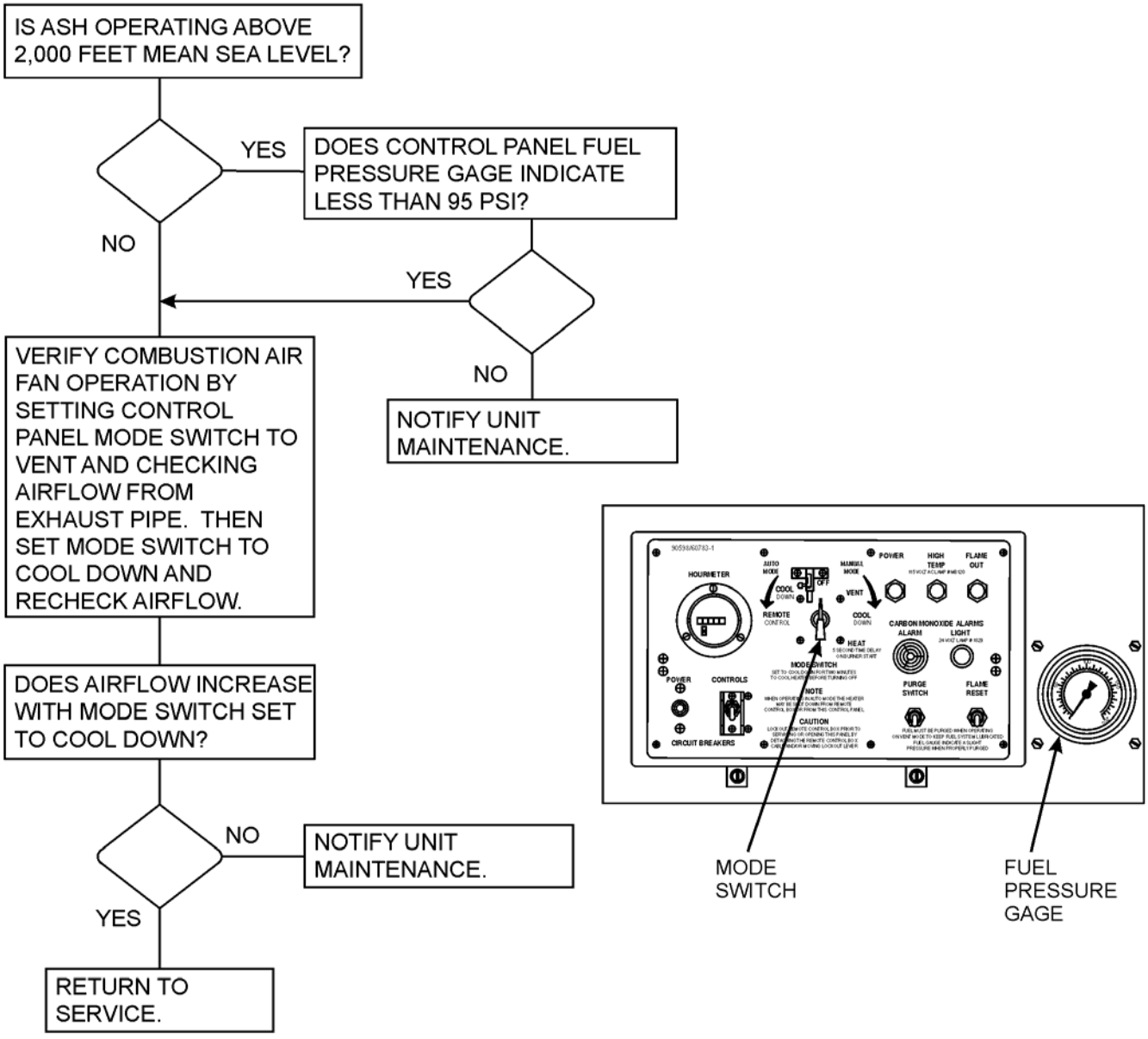
Malfunction 7. Ventilation Air Fan Operates but Fuel Pressure Gage Indicates 0 Psi (0 kPa)





TROUBLESHOOTING PROCEDURES – Continued

Malfunction 8. Excessive Black Smoke in Exhaust



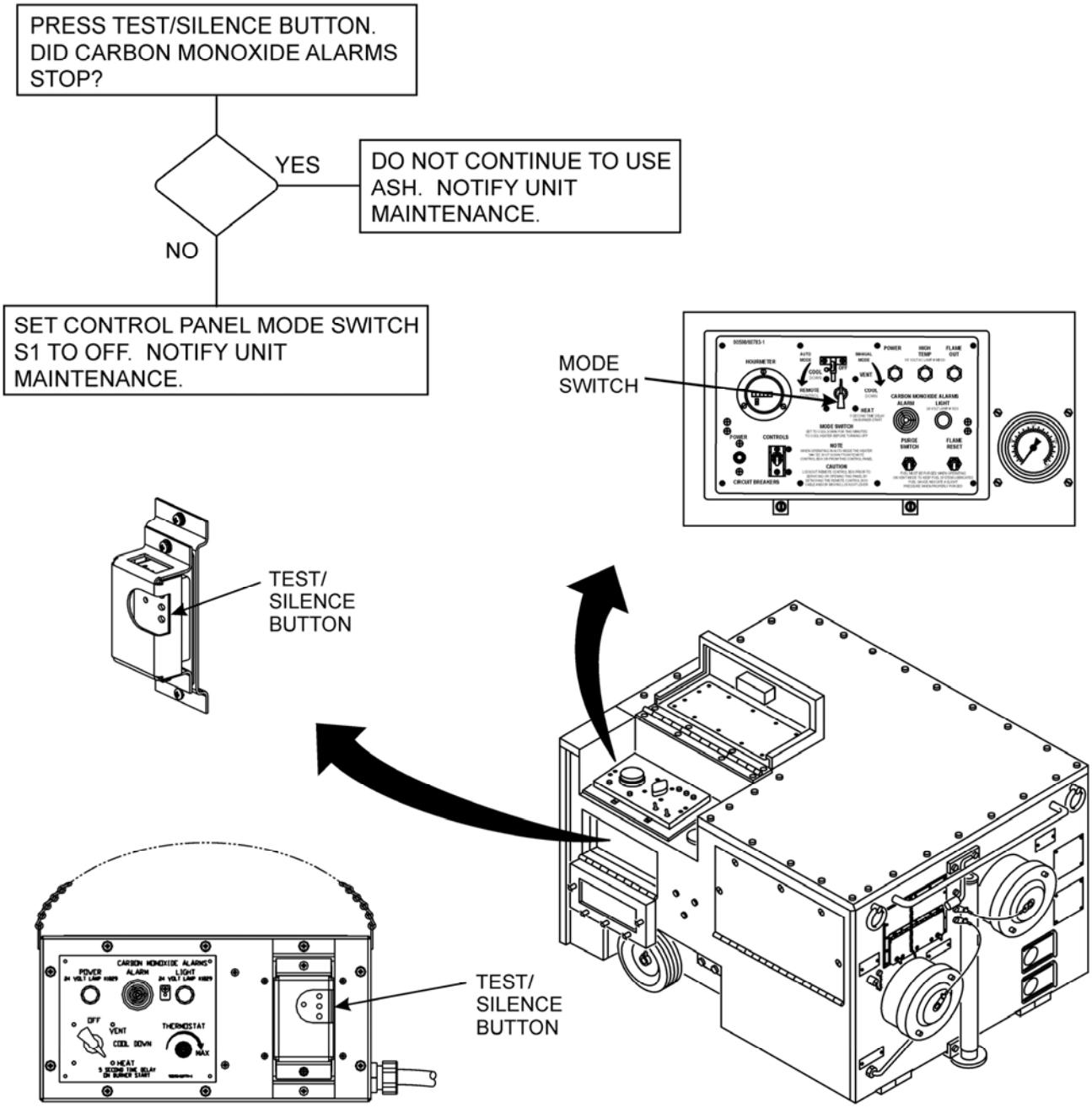
TROUBLESHOOTING PROCEDURES – Continued

Malfunction 9. CARBON MONOXIDE ALARMS Sound and Light

PRESS TEST/SILENCE BUTTON. DID CARBON MONOXIDE ALARMS STOP?

YES → DO NOT CONTINUE TO USE ASH. NOTIFY UNIT MAINTENANCE.

NO → SET CONTROL PANEL MODE SWITCH S1 TO OFF. NOTIFY UNIT MAINTENANCE.



END OF WORK PACKAGE

CHAPTER 4

UNIT TROUBLESHOOTING PROCEDURES FOR ARMY SPACE HEATER H-140

INTRODUCTION

The Troubleshooting Index contains a quick reference by work package and page number for the Troubleshooting Procedures work package (WP 0012 00). The Troubleshooting Procedures work package (WP 0012 00) identifies malfunctions and corrective actions to return the ASH to operational readiness.

Malfunction/Symptom	Troubleshooting Procedure Page No.
1. Ventilation Air Fan Does Not Operate in Manual Mode	0012 00-3
2. Ventilation Air Fan Does Not Operate in Auto Mode	0012 00-7
3. Combustion Air Fan Does Not Operate in Manual Mode	0012 00-15
4. Combustion Air Fan Does Not Operate in Auto Mode	0012 00-19
5. Fuel Pressure Gage Indicates 25 Psi (172 kPa) or Less in HEAT MANUAL MODE or HEAT AUTO MODE	0012 00-23
6. No Fuel Pressure Is Indicated	0012 00-25
7. Low Fuel Pressure Is Indicated	0012 00-29
8. Excessive Black Smoke in Exhaust	0012 00-31
9. Ventilation Air Fan Motor Slows Down or Indicator Lights Dim	0012 00-33
10. Improper Spark or No Spark in Igniter	0012 00-35
11. ASH Backfires or Rumbles in HEAT MANUAL MODE or HEAT AUTO MODE	0012 00-39
12. No Combustion in HEAT MANUAL MODE (FLAME OUT Indicator Is On)	0012 00-41
13. No Combustion in HEAT AUTO MODE (FLAME OUT Indicator Is On)	0012 00-45
14. CARBON MONOXIDE ALARMS Sound and Light	0012 00-49

UNIT TROUBLESHOOTING PROCEDURES

ARMY SPACE HEATER H-140

NSN 4520-01-477-0568

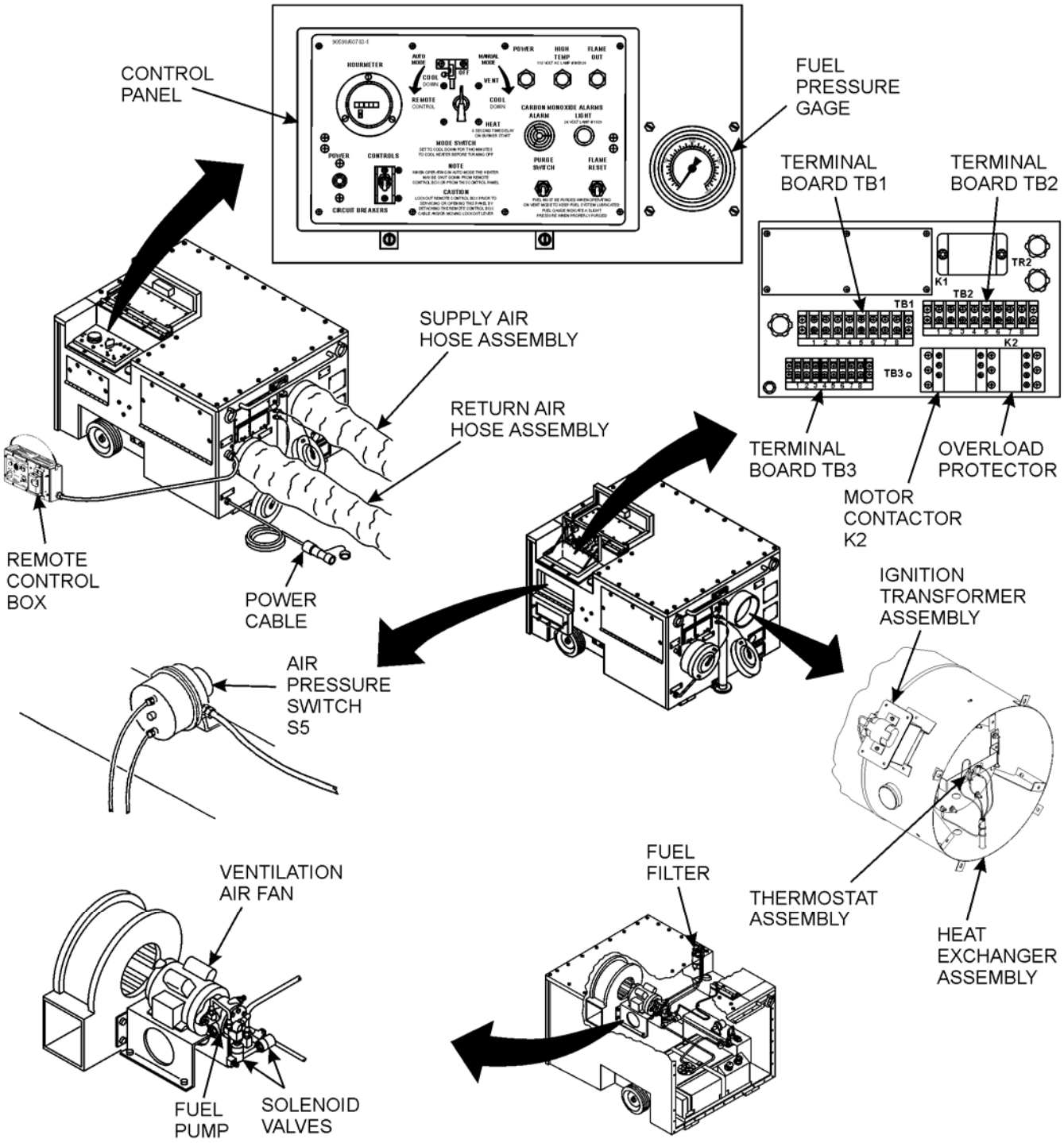
TROUBLESHOOTING PROCEDURES

INTRODUCTION

The Troubleshooting Procedures contain fault trees that identify the malfunctions, tests or inspections, and corrective actions required to return the ASH to operational readiness. The tests/inspections and corrective actions should be performed in the order listed. During troubleshooting, refer to Figure FO-1, ASH Electrical Schematic Diagram, and the following Troubleshooting Component Location Guide.

TROUBLESHOOTING COMPONENT LOCATION GUIDE

The following illustration is used to locate major components when performing ASH troubleshooting.



INITIAL SETUP:

Test Equipment
Multimeter (item 1, WP 0058 00)

Tools and Special Tools
None

Personnel Required
One

References
WP 0005 00
WP 0026 00
WP 0032 00

References – Continued
WP 0039 00
WP 0040 00
WP 0049 00, table 1
FM 4-25.11

Materials/Parts
None

Equipment Condition
None

WARNING

Heat exchanger overheating may damage the ASH and under some conditions a safety hazard may result. An overheat shutdown occurs when the combustion air and ventilation air fan assemblies are turned off at the same time when in the heating modes. Always set the control panel MODE SWITCH to the VENT position for at least 2 minutes when shutting down the ASH from the heating modes.

FOR ARTIFICIAL RESPIRATION, REFER TO FM 4-25.11, FIRST AID.

Electrical high voltage cannot be seen but can kill you. Electricity is unlike most other dangerous things you can come in contact with because it gives no warning and no symptoms to be wary of. Its effect is immediate. It can kill you, render you unconscious, or severely burn you.

To ensure your safety and that of other maintenance personnel, always observe the following precautions:

DO NOT perform any maintenance on electrical equipment unless all power is removed.

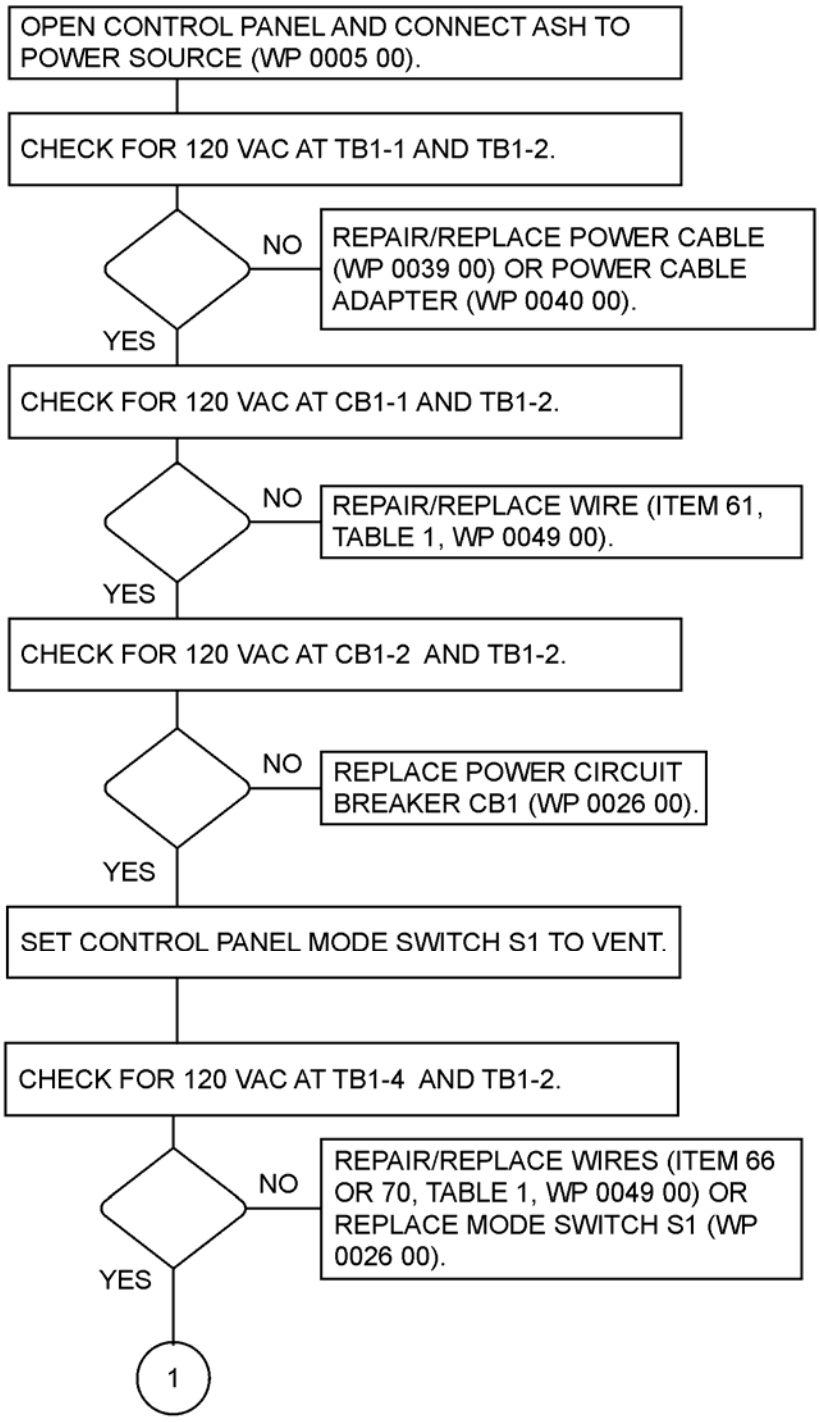
BE CERTAIN that there is someone assisting you who can remove power immediately.

TROUBLESHOOTING PROCEDURES

Malfunction 1. Ventilation Air Fan Does Not Operate in Manual Mode

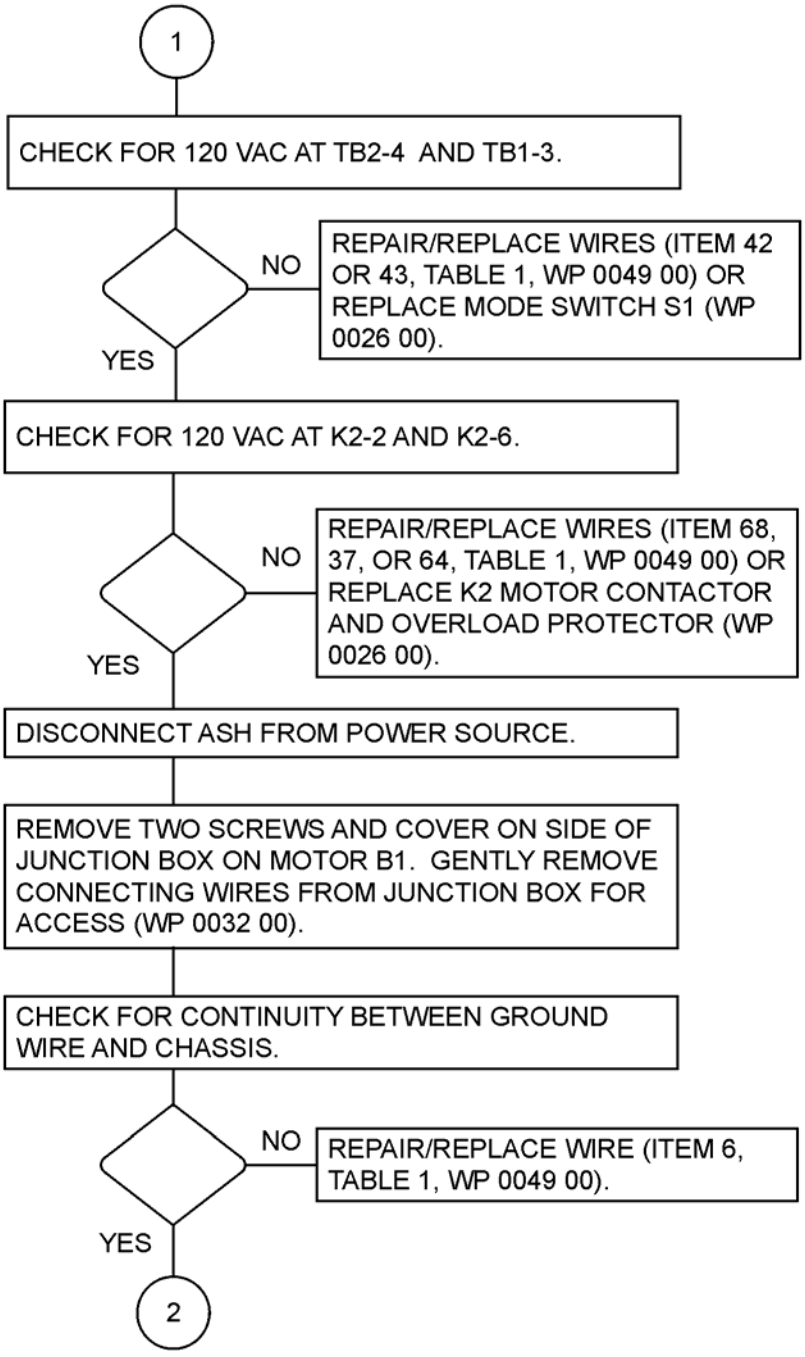
TROUBLESHOOTING PROCEDURES – Continued

Malfunction 1. Ventilation Air Fan Does Not Operate in Manual Mode – Continued



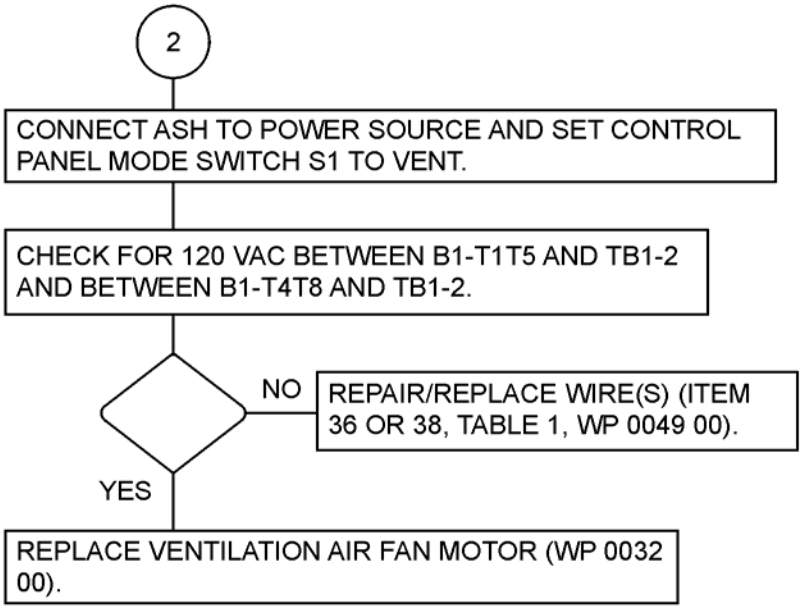
TROUBLESHOOTING PROCEDURES – Continued

Malfunction 1. Ventilation Air Fan Does Not Operate in Manual Mode – Continued



TROUBLESHOOTING PROCEDURES – Continued

Malfunction 1. Ventilation Air Fan Does Not Operate in Manual Mode – Continued



INITIAL SETUP:

Test Equipment
Multimeter (item 1, WP 0058 00)

Tools and Special Tools
None

Personnel Required
One

References
WP 0005 00
WP 0026 00

References – Continued
WP 0038 00
WP 0041 00
WP 0049 00, tables 1 and 2
FM 4-25.11

Materials/Parts
None

Equipment Condition
None

WARNING

Heat exchanger overheating may damage the ASH and under some conditions a safety hazard may result. An overheat shutdown occurs when the combustion air and ventilation air fan assemblies are turned off at the same time when in the heating modes. Always set the control panel MODE SWITCH to the VENT position for at least 2 minutes when shutting down the ASH from the heating modes.

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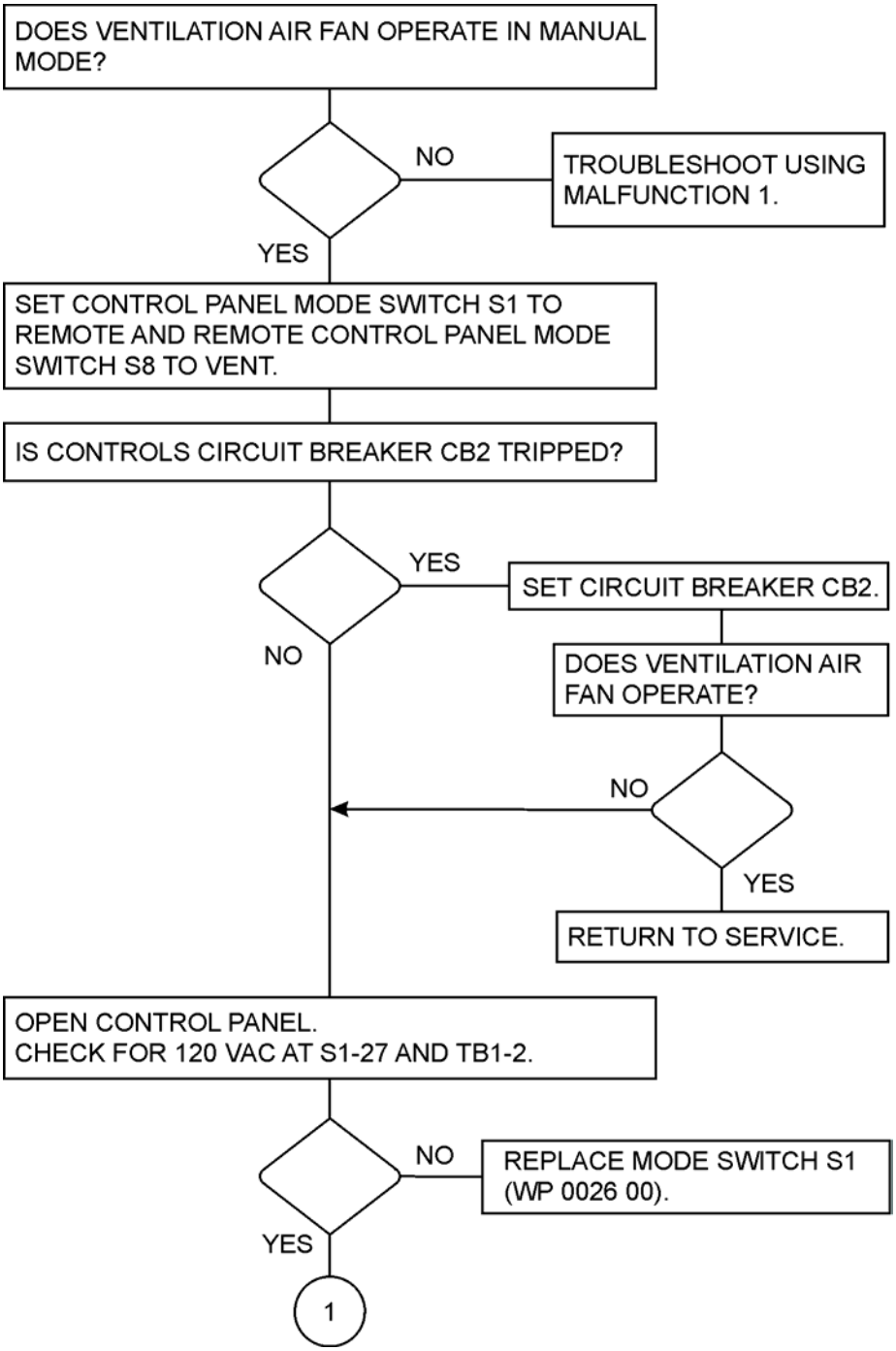
BE CERTAIN that there is someone assisting you who can remove power immediately.

TROUBLESHOOTING PROCEDURES – Continued

Malfunction 2. Ventilation Air Fan Does Not Operate in Auto Mode

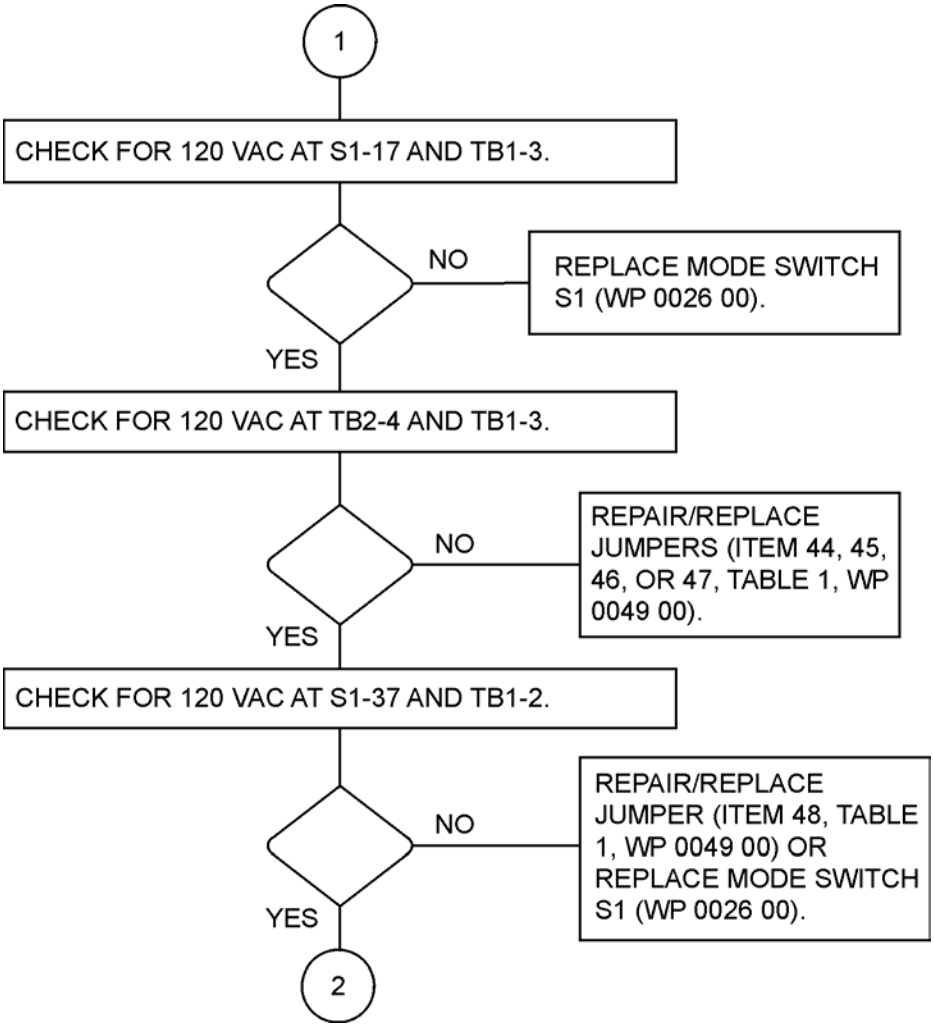
TROUBLESHOOTING PROCEDURES – Continued

Malfunction 2. Ventilation Air Fan Does Not Operate in Auto Mode – Continued



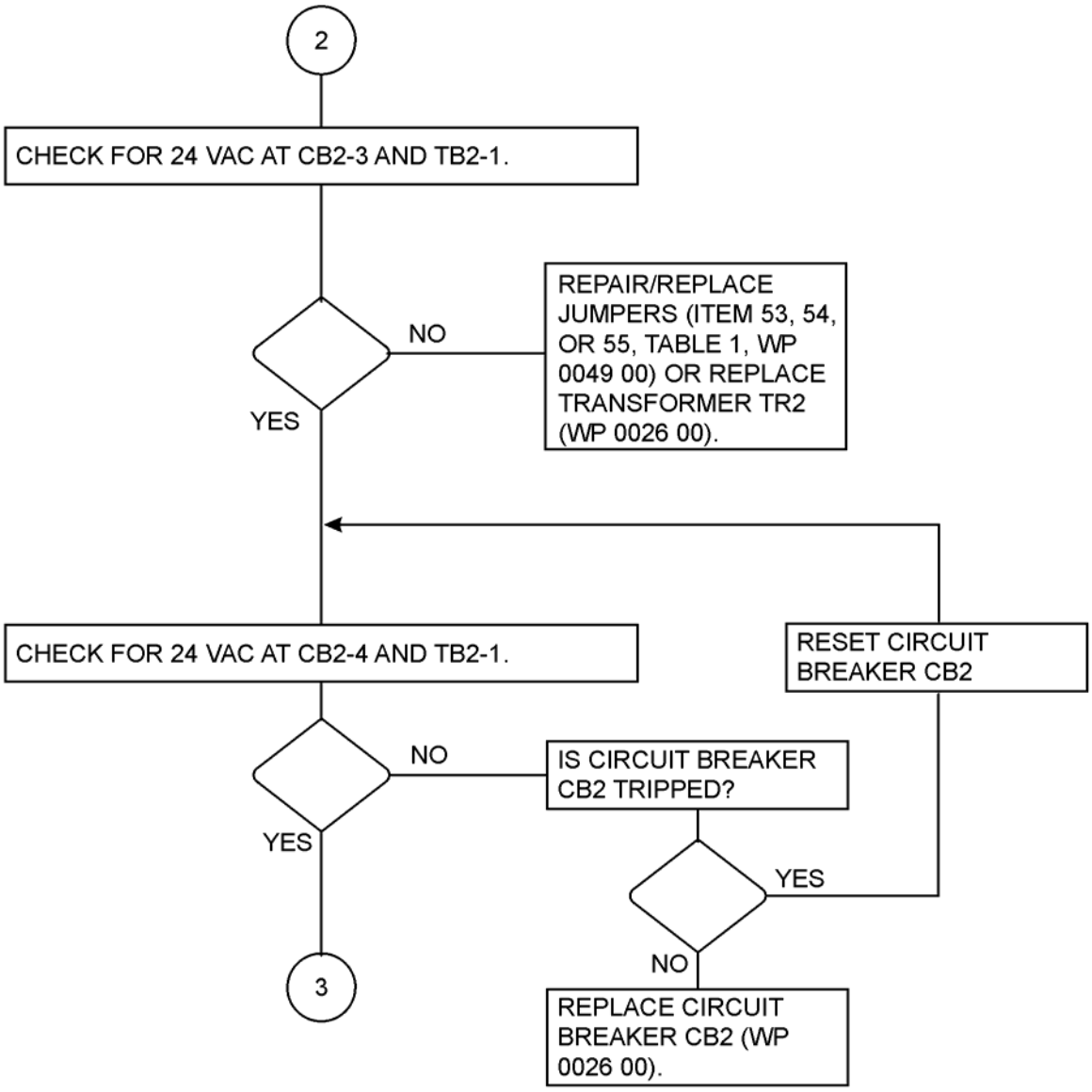
TROUBLESHOOTING PROCEDURES – Continued

Malfunction 2. Ventilation Air Fan Does Not Operate in Auto Mode – Continued



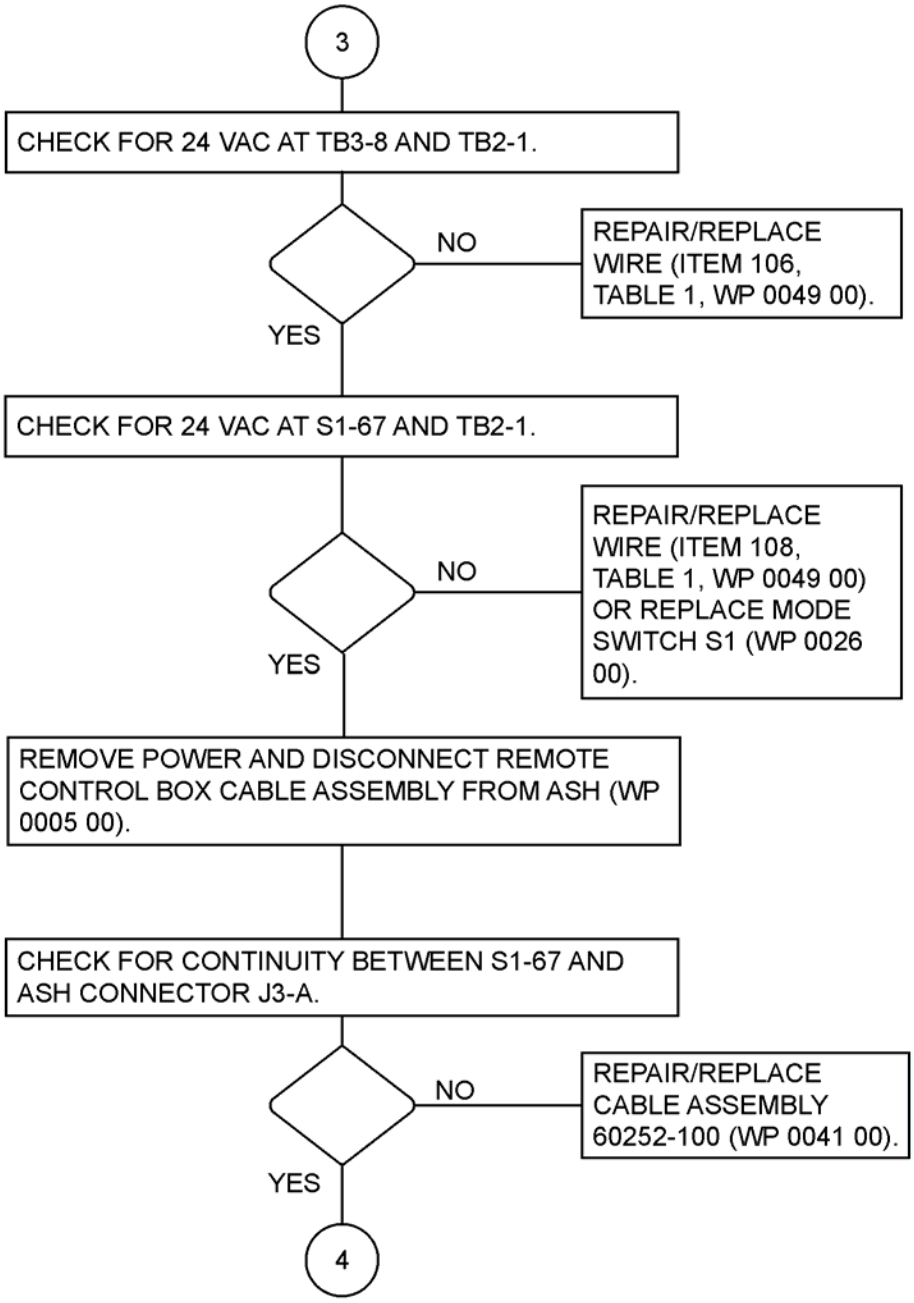
TROUBLESHOOTING PROCEDURES – Continued

Malfunction 2. Ventilation Air Fan Does Not Operate in Auto Mode – Continued



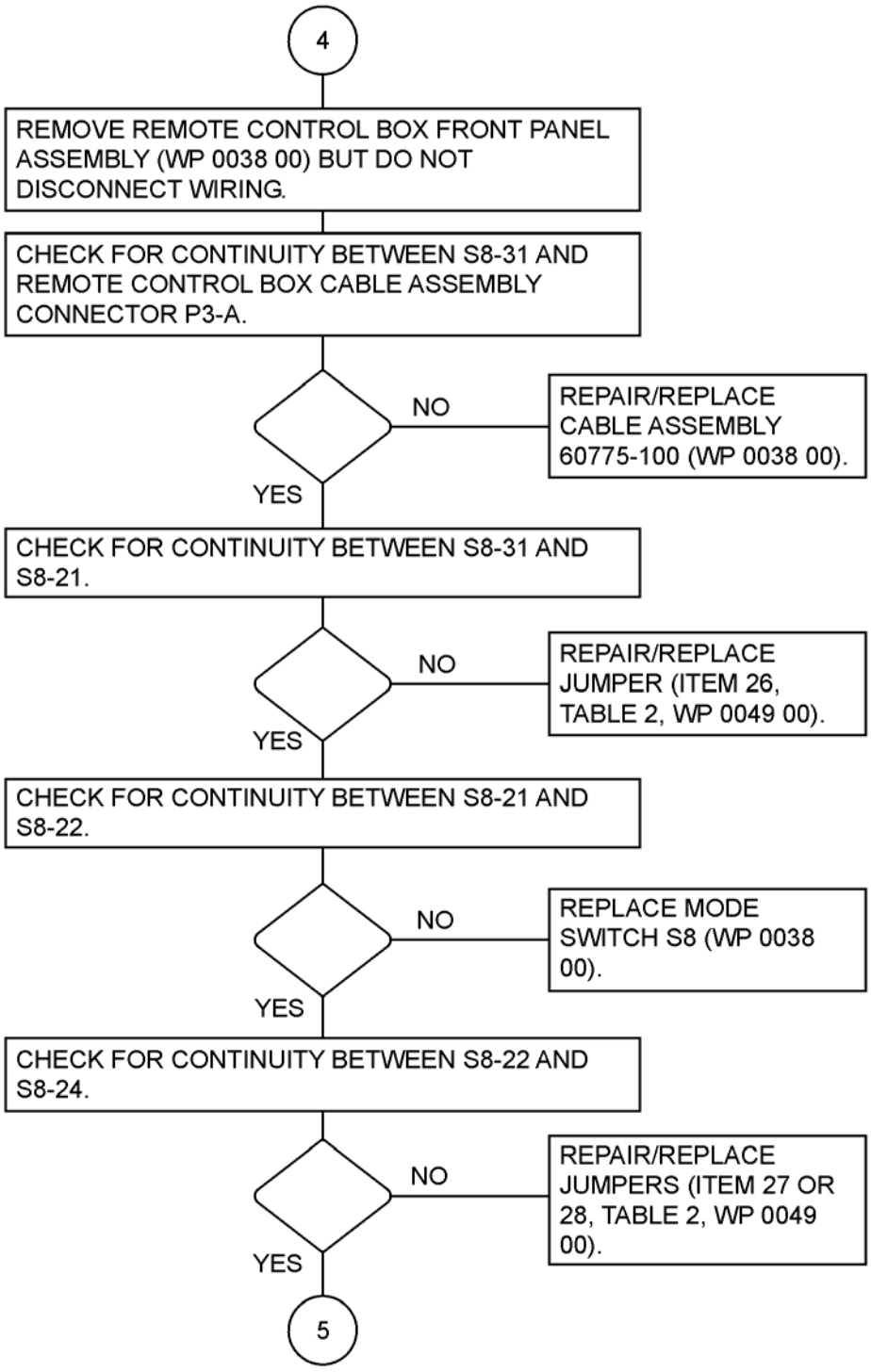
TROUBLESHOOTING PROCEDURES – Continued

Malfunction 2. Ventilation Air Fan Does Not Operate in Auto Mode – Continued



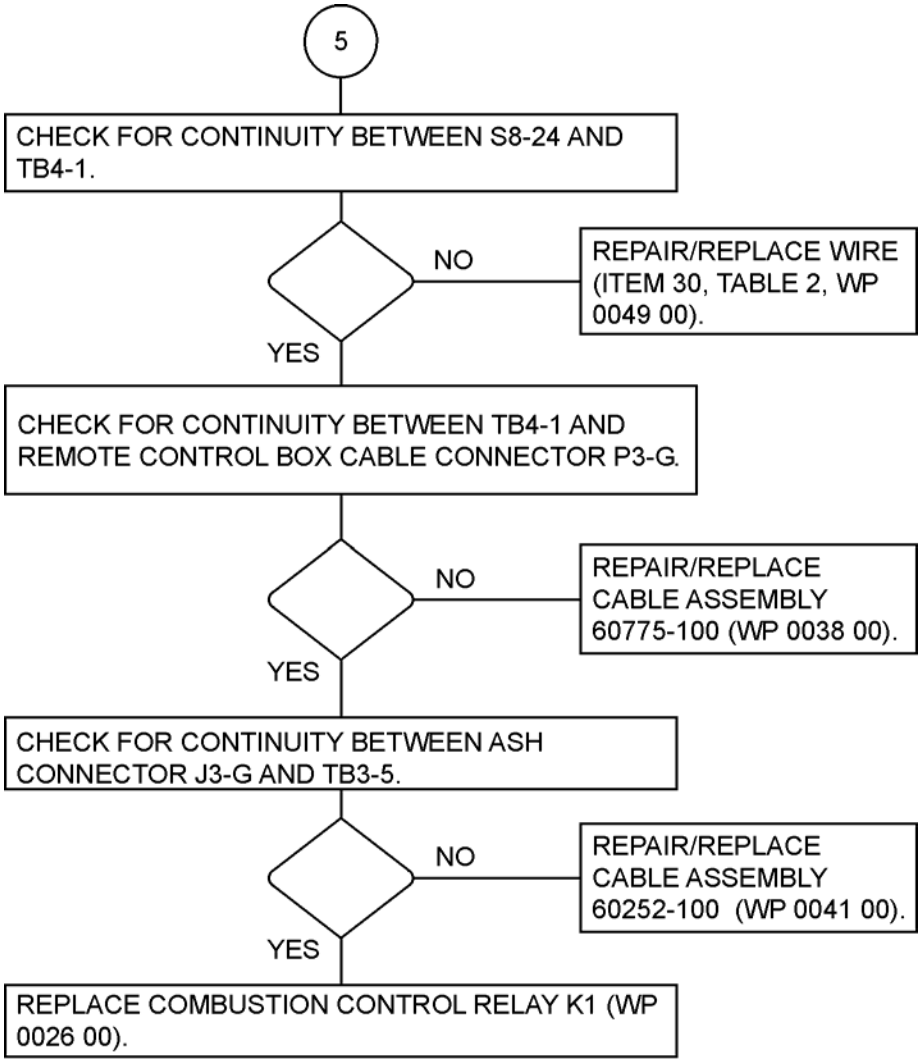
TROUBLESHOOTING PROCEDURES – Continued

Malfunction 2. Ventilation Air Fan Does Not Operate in Auto Mode – Continued



TROUBLESHOOTING PROCEDURES – Continued

Malfunction 2. Ventilation Air Fan Does Not Operate in Auto Mode – Continued



INITIAL SETUP:

Test Equipment
Multimeter (item 1, WP 0058 00)

Tools and Special Tools
None

Personnel Required
One

References
WP 0005 00
WP 0026 00

References – Continued
WP 0028 00
WP 0033 00
WP 0049 00, table 1
FM 4-25.11

Materials/Parts
None

Equipment Condition
None

WARNING

Heat exchanger overheating may damage the ASH and under some conditions a safety hazard may result. An overheat shutdown occurs when the combustion air and ventilation air fan assemblies are turned off at the same time when in the heating modes. Always set the control panel MODE SWITCH to the VENT position for at least 2 minutes when shutting down the ASH from the heating modes.

FOR ARTIFICIAL RESPIRATION, REFER TO FM 4-25.11, FIRST AID.

Electrical high voltage cannot be seen but can kill you. Electricity is unlike most other dangerous things you can come in contact with because it gives no warning and no symptoms to be wary of. Its effect is immediate. It can kill you, render you unconscious, or severely burn you.

To ensure your safety and that of other maintenance personnel, always observe the following precautions:

DO NOT perform any maintenance on electrical equipment unless all power is removed.

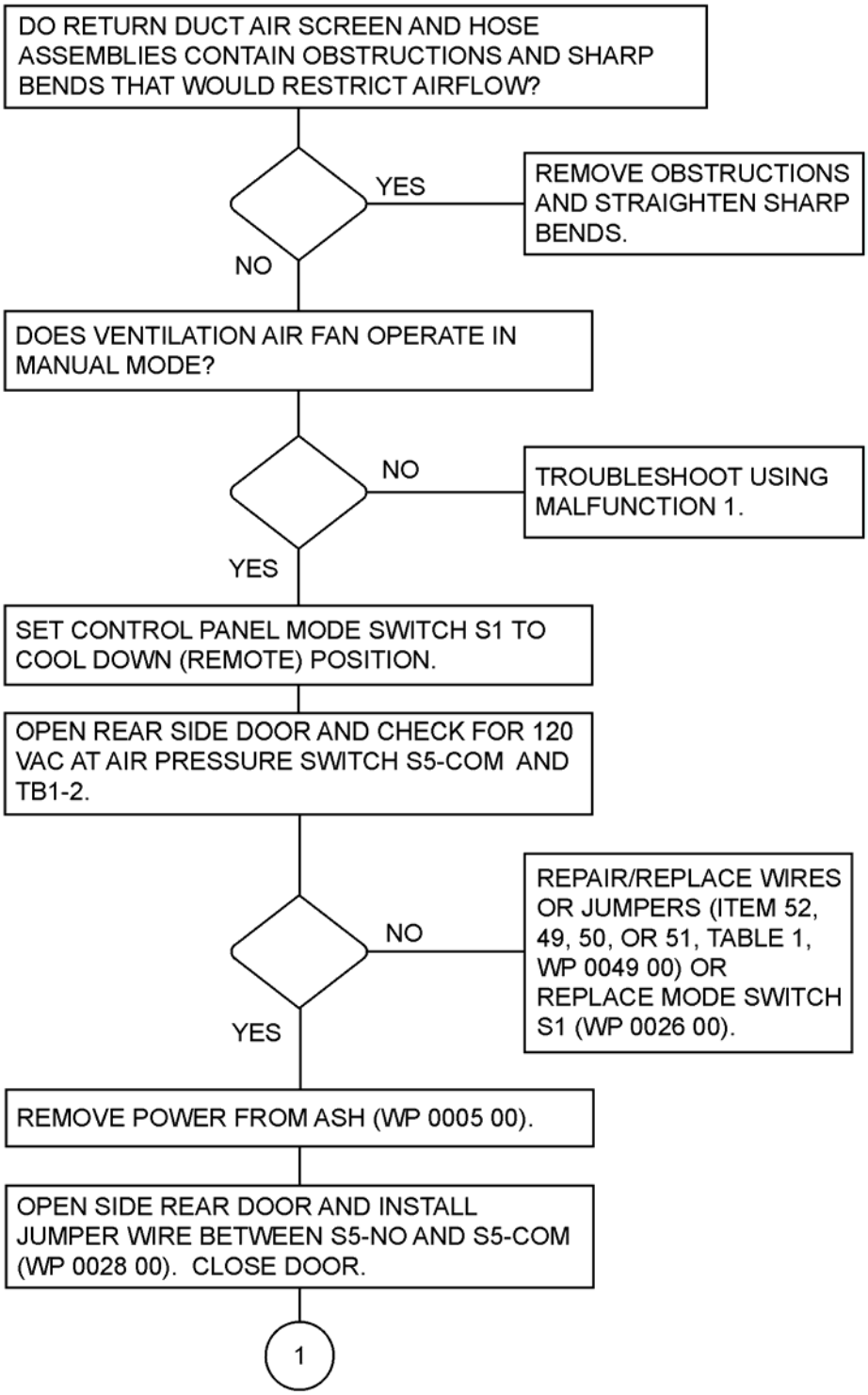
BE CERTAIN that there is someone assisting you who can remove power immediately.

TROUBLESHOOTING PROCEDURES – Continued

Malfunction 3. Combustion Air Fan Does Not Operate in Manual Mode

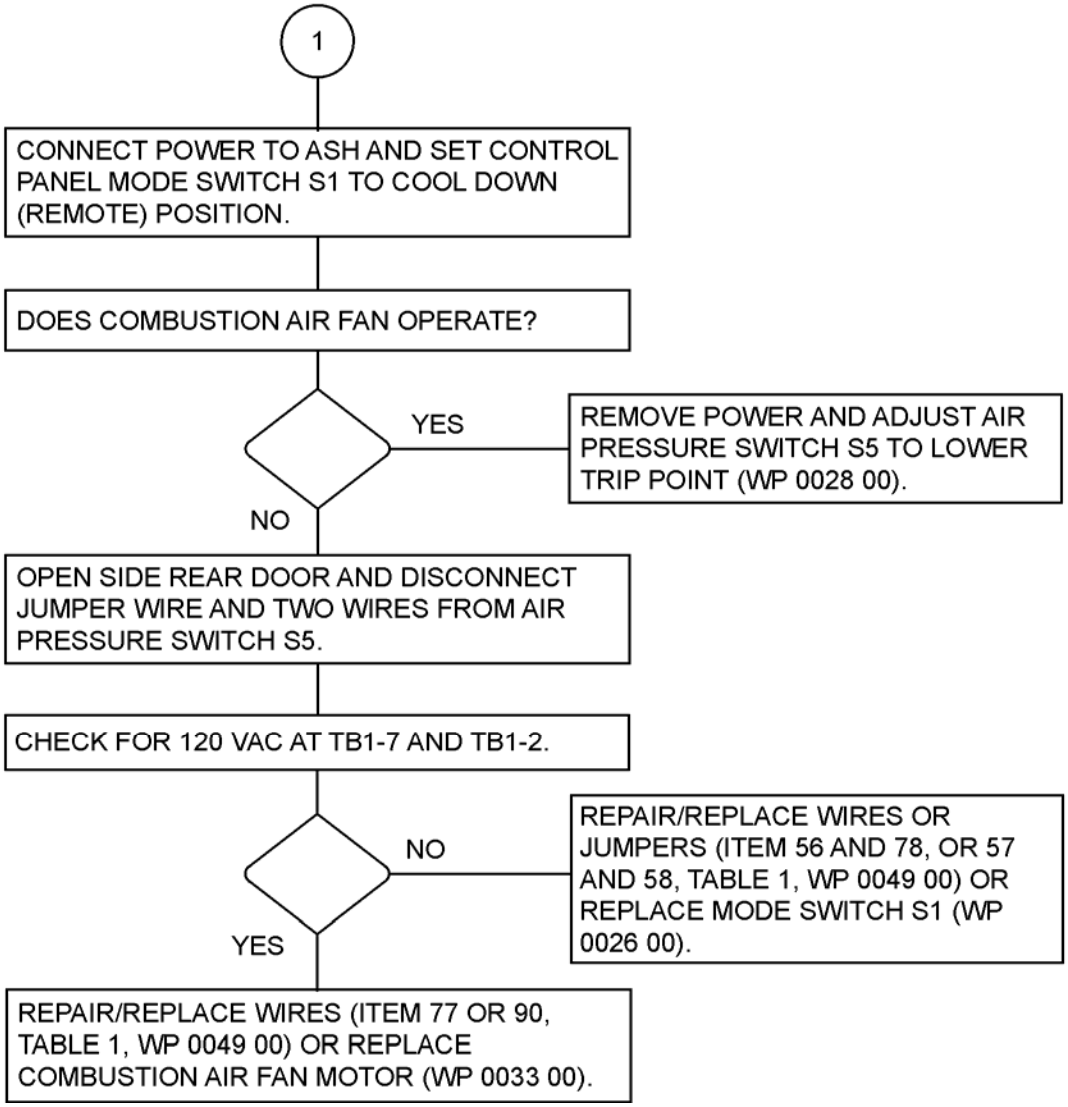
TROUBLESHOOTING PROCEDURES – Continued

Malfunction 3. Combustion Air Fan Does Not Operate in Manual Mode – Continued



TROUBLESHOOTING PROCEDURES – Continued

Malfunction 3. Combustion Air Fan Does Not Operate in Manual Mode – Continued



INITIAL SETUP:

Test Equipment
Multimeter (item 1, WP 0058 00)

Tools and Special Tools
None

Personnel Required
One

References
WP 0026 00
WP 0038 00

References – Continued
WP 0041 00
WP 0049 00, table 2
FM 4-25.11

Materials/Parts
None

Equipment Condition
None

WARNING

Heat exchanger overheating may damage the ASH and under some conditions a safety hazard may result. An overheat shutdown occurs when the combustion air and ventilation air fan assemblies are turned off at the same time when in the heating modes. Always set the control panel MODE SWITCH to the VENT position for at least 2 minutes when shutting down the ASH from the heating modes.

FOR ARTIFICIAL RESPIRATION, REFER TO FM 4-25.11, FIRST AID.

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To ensure your safety and that of other maintenance personnel, always observe the following precautions:

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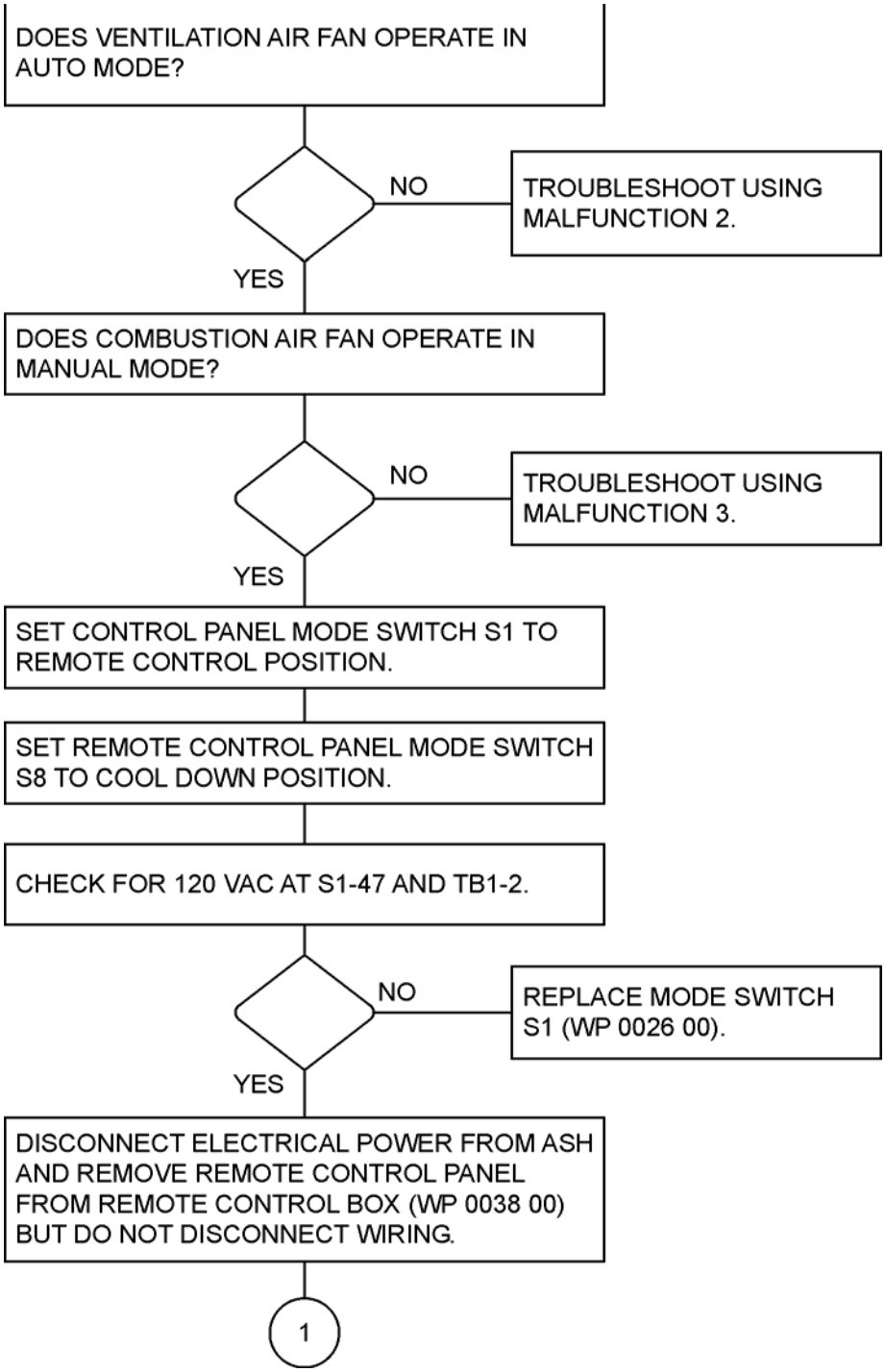
BE CERTAIN that there is someone assisting you who can remove power immediately.

TROUBLESHOOTING PROCEDURES – Continued

Malfunction 4. Combustion Air Fan Does Not Operate in Auto Mode

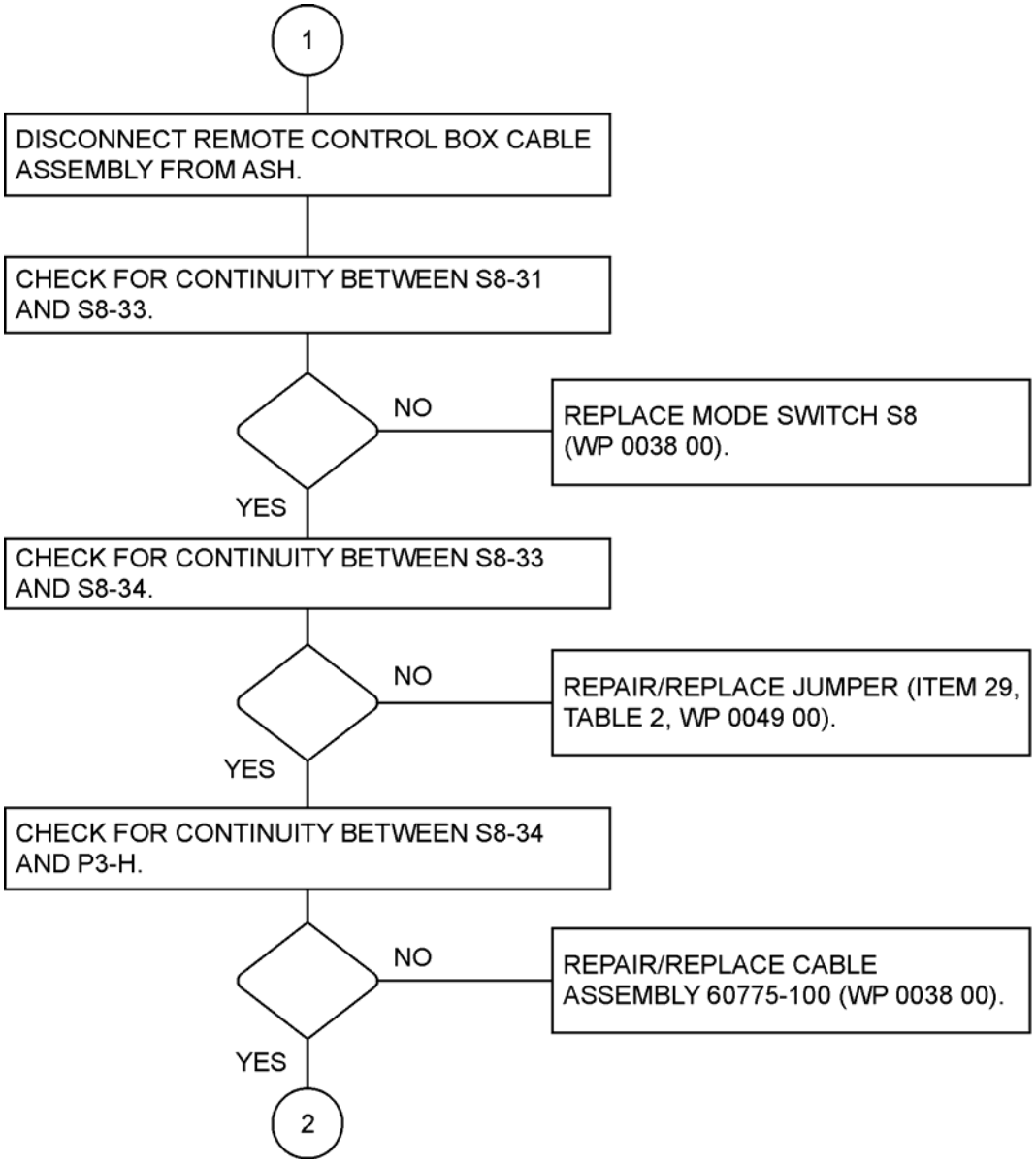
TROUBLESHOOTING PROCEDURES – Continued

Malfunction 4. Combustion Air Fan Does Not Operate in Auto Mode – Continued



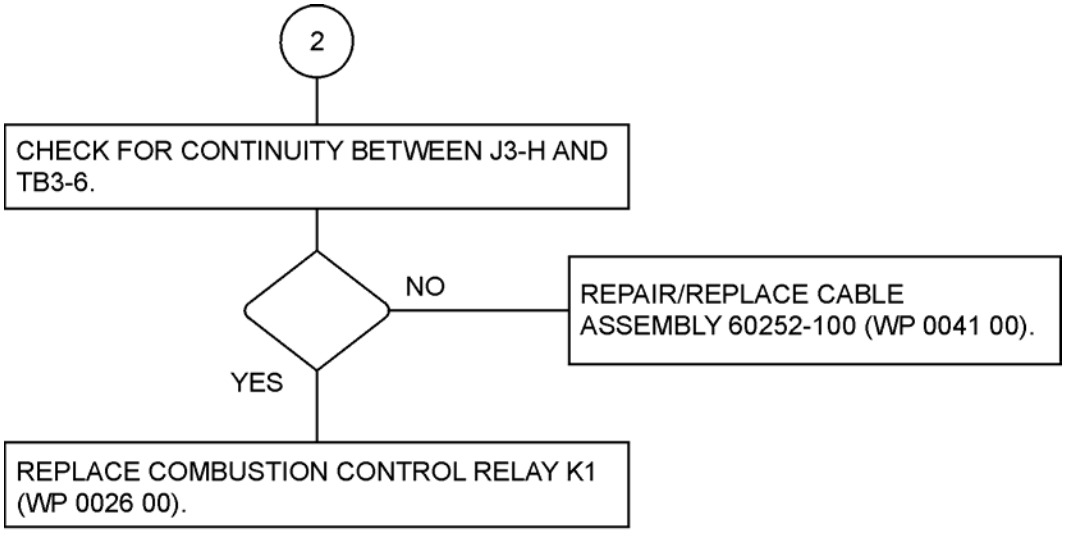
TROUBLESHOOTING PROCEDURES – Continued

Malfunction 4. Combustion Air Fan Does Not Operate in Auto Mode – Continued



TROUBLESHOOTING PROCEDURES – Continued

Malfunction 4. Combustion Air Fan Does Not Operate in Auto Mode – Continued



INITIAL SETUP:

Test Equipment
None

Tools and Special Tools
None

Personnel Required
One

References
WP 0005 00
WP 0030 00

References – Continued
WP 0031 00
FM 4-25.11
FM 10-67-1

Materials/Parts
None

Equipment Condition
None

WARNING

Heat exchanger overheating may damage the ASH and under some conditions a safety hazard may result. An overheat shutdown occurs when the combustion air and ventilation air fan assemblies are turned off at the same time when in the heating modes. Always set the control panel MODE SWITCH to the VENT position for at least 2 minutes when shutting down the ASH from the heating modes.

FOR FUEL SPILLS, REFER TO FM 10-67-1, CONCEPTS AND EQUIPMENT OF PETROLEUM OPERATIONS.

Fuel is flammable and toxic to eyes, skin, and respiratory tract. Skin/eye protection is required. Avoid repeated/prolonged contact. Use only in well-ventilated areas. Keep away from open flames or other sources of ignition. Post FUEL FLAMMABLE/NO SMOKING signs around the area. Be sure a fire extinguisher is available.

Fuel on clothing can be fatal if ignited by a static discharge. If fuel gets on clothes, leave the refueling area as soon as possible, remove clothes, and wash skin with warm, soapy water before getting dressed.

Spilled fuel creates a flammable, vapor-air mixture and fire can take place. Improper positioning of external fuel source can cause fuel tank to overflow. Stop refueling immediately if fuel spill occurs.

FOR ARTIFICIAL RESPIRATION, REFER TO FM 4-25.11, FIRST AID.

Electrical high voltage cannot be seen but can kill you. Electricity is unlike most other dangerous things you can come in contact with because it gives no warning and no symptoms to be wary of. Its effect is immediate. It can kill you, render you unconscious, or severely burn you.

To ensure your safety and that of other maintenance personnel, always observe the following precautions:

DO NOT perform any maintenance on electrical equipment unless all power is removed.

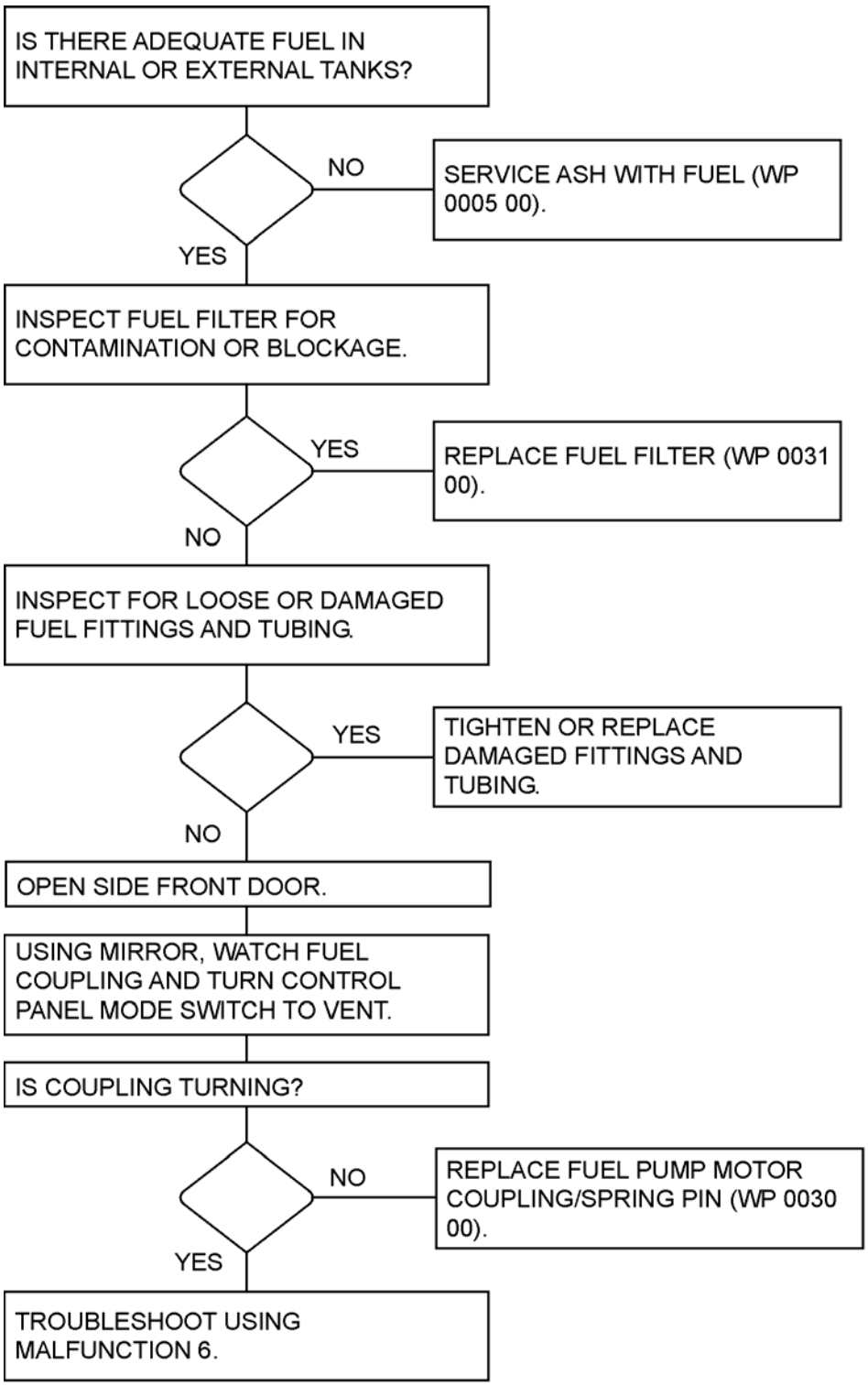
BE CERTAIN that there is someone assisting you who can remove power immediately.

TROUBLESHOOTING PROCEDURES – Continued

Malfunction 5. Fuel Pressure Gage Indicates 25 Psi (172 kPa) or Less in HEAT MANUAL MODE or HEAT AUTO MODE

TROUBLESHOOTING PROCEDURES – Continued

Malfunction 5. Fuel Pressure Gage Indicates 25 Psi (172 kPa) or Less in HEAT MANUAL MODE or HEAT AUTO MODE – Continued



INITIAL SETUP:

Test Equipment
None

Tools and Special Tools
None

Personnel Required
One

References
WP 0005 00
WP 0027 00

References – Continued
WP 0030 00
WP 0031 00
FM 4-25.11
FM 10-67-1

Materials/Parts
None

Equipment Condition
None

WARNING

Heat exchanger overheating may damage the ASH and under some conditions a safety hazard may result. An overheat shutdown occurs when the combustion air and ventilation air fan assemblies are turned off at the same time when in the heating modes. Always set the control panel MODE SWITCH to the VENT position for at least 2 minutes when shutting down the ASH from the heating modes.

Contact with hot components can cause burns. Allow ASH to cool down before attempting service, inspection, or maintenance activity.

FOR FUEL SPILLS, REFER TO FM 10-67-1, CONCEPTS AND EQUIPMENT OF PETROLEUM OPERATIONS.

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To ensure your safety and that of other maintenance personnel, always observe the following precautions:

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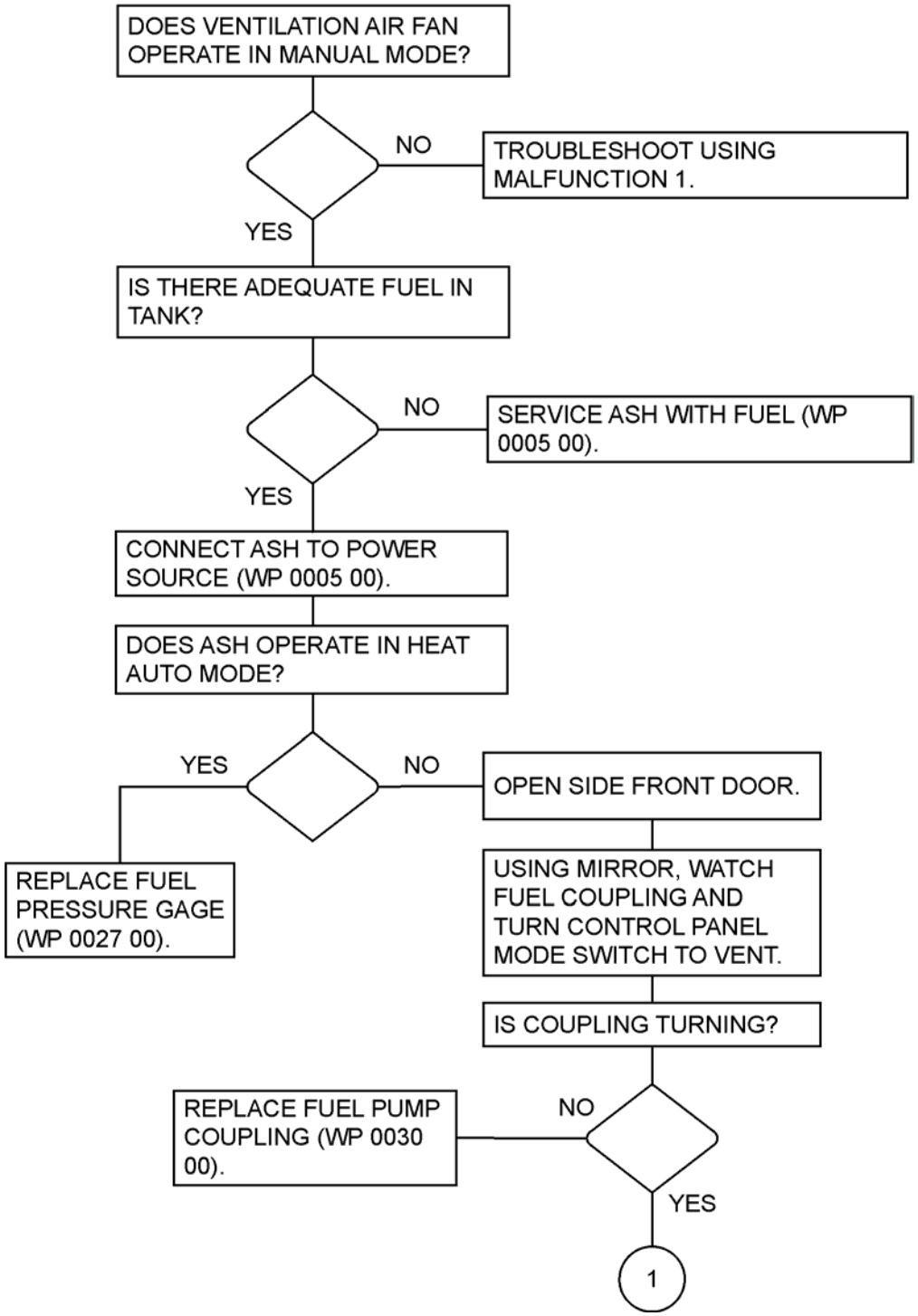
BE CERTAIN that there is someone assisting you who can remove power immediately.

TROUBLESHOOTING PROCEDURES – Continued

Malfunction 6. No Fuel Pressure Is Indicated

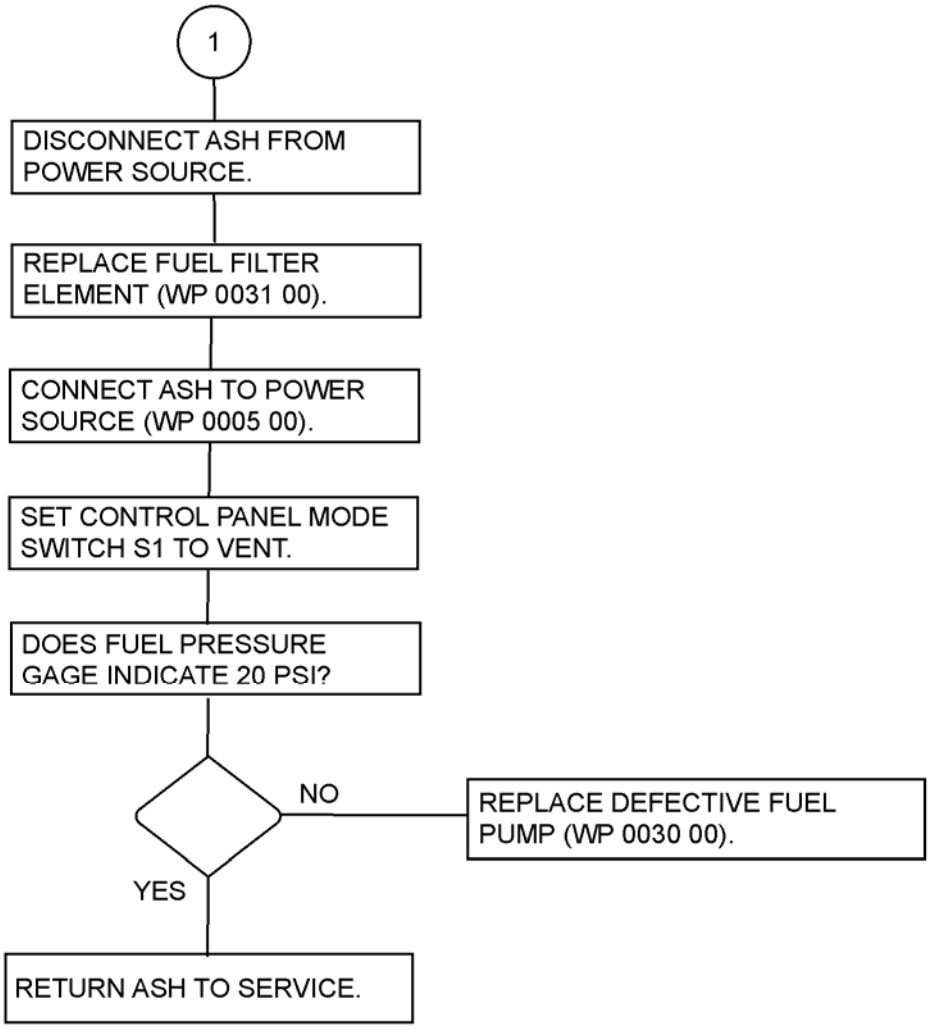
TROUBLESHOOTING PROCEDURES – Continued

Malfunction 6. No Fuel Pressure Is Indicated – Continued



TROUBLESHOOTING PROCEDURES – Continued

Malfunction 6. No Fuel Pressure Is Indicated – Continued



INITIAL SETUP:

Test Equipment
None

Tools and Special Tools
None

Personnel Required
One

References
WP 0005 00
WP 0030 00

References – Continued
WP 0031 00
FM 4-25.11
FM 10-67-1

Materials/Parts
None

Equipment Condition
None

WARNING

Heat exchanger overheating may damage the ASH and under some conditions a safety hazard may result. An overheat shutdown occurs when the combustion air and ventilation air fan assemblies are turned off at the same time when in the heating modes. Always set the control panel MODE SWITCH to the VENT position for at least 2 minutes when shutting down the ASH from the heating modes.

Contact with hot components can cause burns. Allow ASH to cool down before attempting service, inspection, or maintenance activity.

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Fuel is flammable and toxic to eyes, skin, and respiratory tract. Skin/eye protection is required. Avoid repeated/prolonged contact. Use only in well-ventilated areas. Keep away from open flames or other sources of ignition. Post FUEL FLAMMABLE/NO SMOKING signs around the area. Be sure a fire extinguisher is available.

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Spilled fuel creates a flammable, vapor-air mixture and fire can take place. Improper positioning of external fuel source can cause fuel tank to overflow. Stop refueling immediately if fuel spill occurs.

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To ensure your safety and that of other maintenance personnel, always observe the following precautions:

DO NOT perform any maintenance on electrical equipment unless all power is removed.

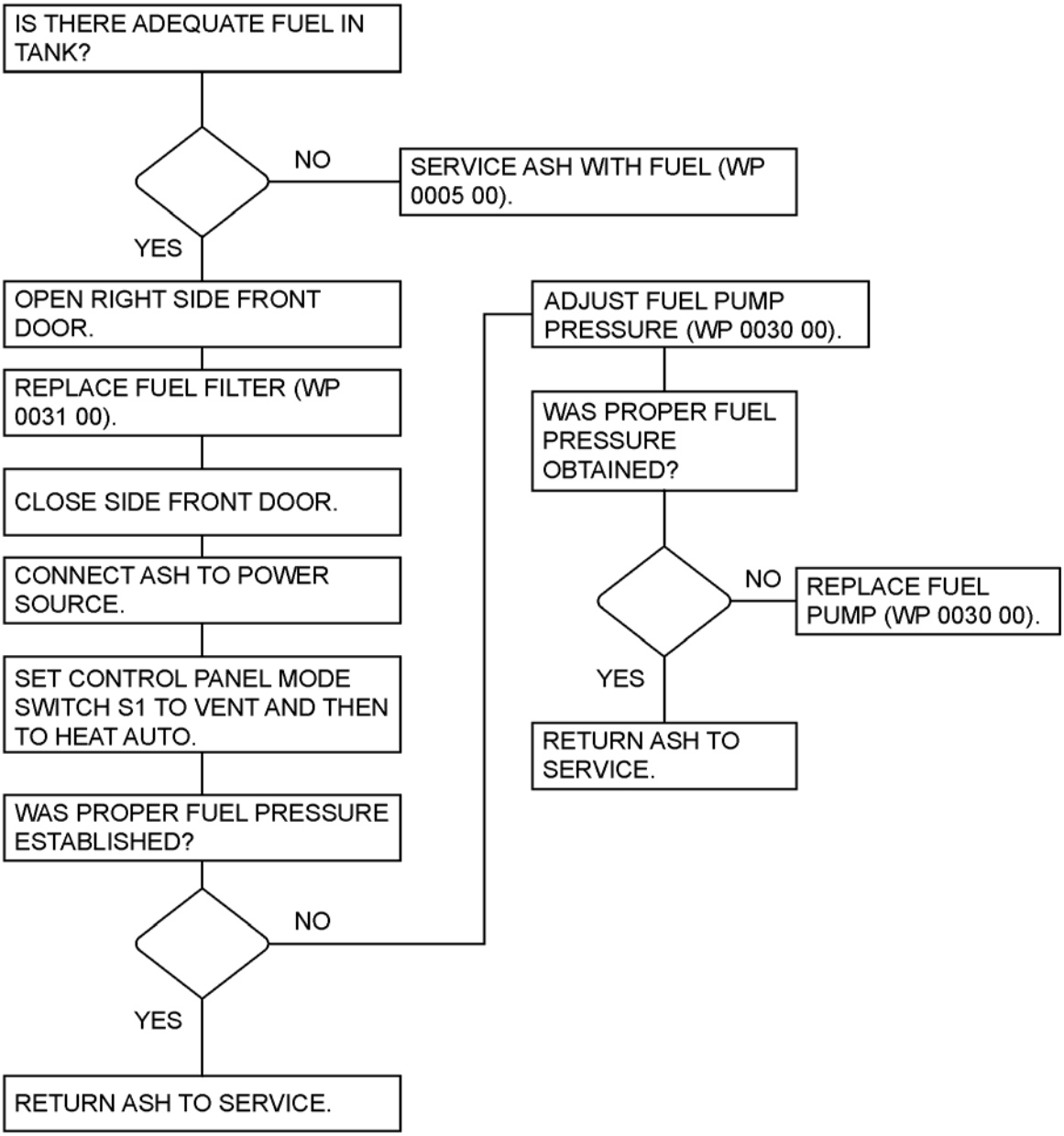
BE CERTAIN that there is someone assisting you who can remove power immediately.

TROUBLESHOOTING PROCEDURES – Continued

Malfunction 7. Low Fuel Pressure Is Indicated

TROUBLESHOOTING PROCEDURES – Continued

Malfunction 7. Low Fuel Pressure Is Indicated – Continued



INITIAL SETUP:

Test Equipment
None

Tools and Special Tools
None

Personnel Required
One

References
WP 0030 00
WP 0033 00
WP 0036 00
FM 4-25.11

Materials/Parts
None

Equipment Condition
None

WARNING

Heat exchanger overheating may damage the ASH and under some conditions a safety hazard may result. An overheat shutdown occurs when the combustion air and ventilation air fan assemblies are turned off at the same time when in the heating modes. Always set the control panel MODE SWITCH to the VENT position for at least 2 minutes when shutting down the ASH from the heating modes.

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To ensure your safety and that of other maintenance personnel, always observe the following precautions:

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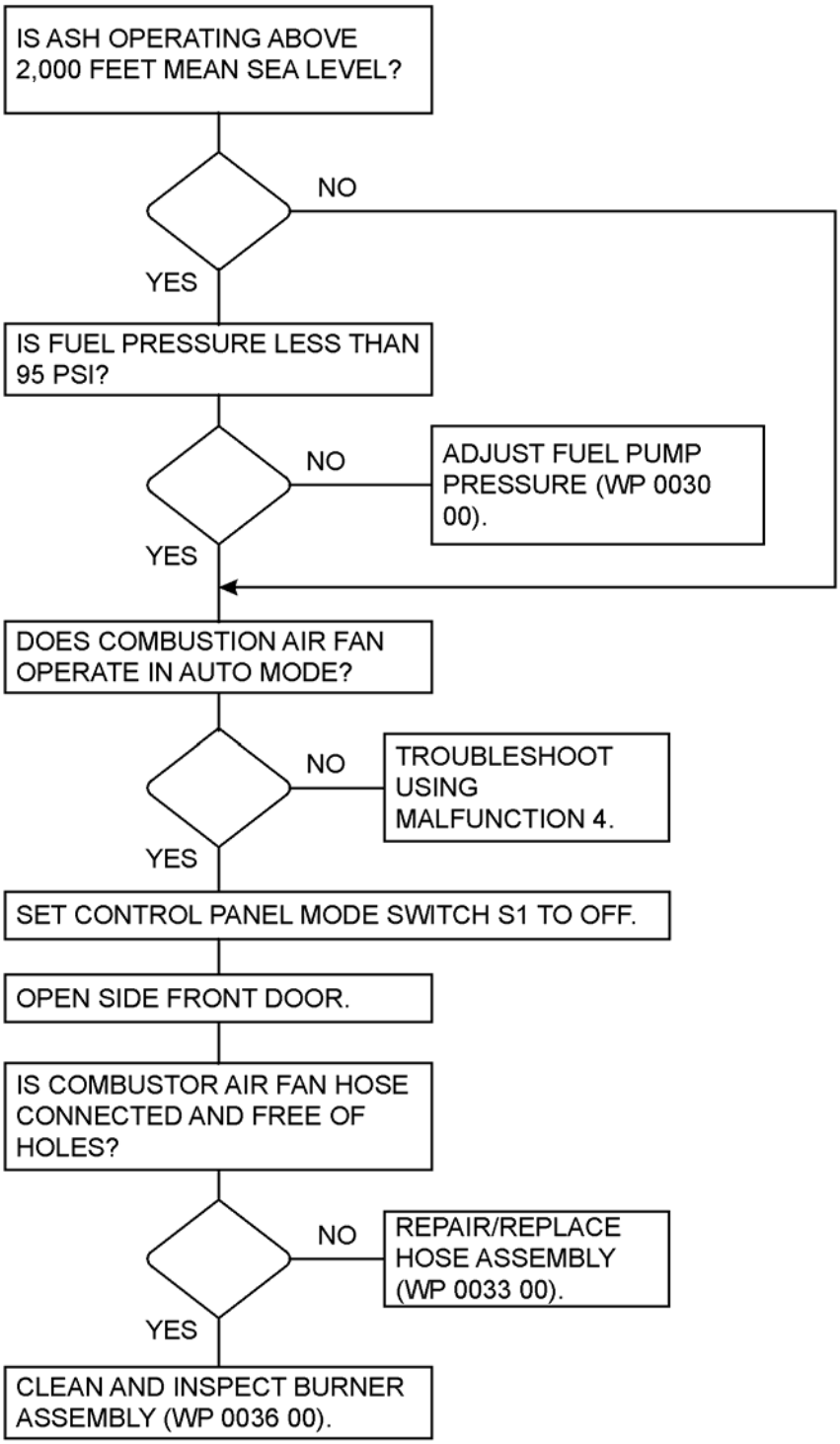
BE CERTAIN that there is someone assisting you who can remove power immediately.

TROUBLESHOOTING PROCEDURES – Continued

Malfunction 8. Excessive Black Smoke in Exhaust

TROUBLESHOOTING PROCEDURES – Continued

Malfunction 8. Excessive Black Smoke in Exhaust – Continued



INITIAL SETUP:

Test Equipment
None

Tools and Special Tools
None

Personnel Required
One

References
WP 0039 00
WP 0040 00
FM 4-25.11

Materials/Parts
None

Equipment Condition
None

WARNING

Heat exchanger overheating may damage the ASH and under some conditions a safety hazard may result. An overheat shutdown occurs when the combustion air and ventilation air fan assemblies are turned off at the same time when in the heating modes. Always set the control panel MODE SWITCH to the VENT position for at least 2 minutes when shutting down the ASH from the heating modes.

FOR ARTIFICIAL RESPIRATION, REFER TO FM 4-25.11, FIRST AID.

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To ensure your safety and that of other maintenance personnel, always observe the following precautions:

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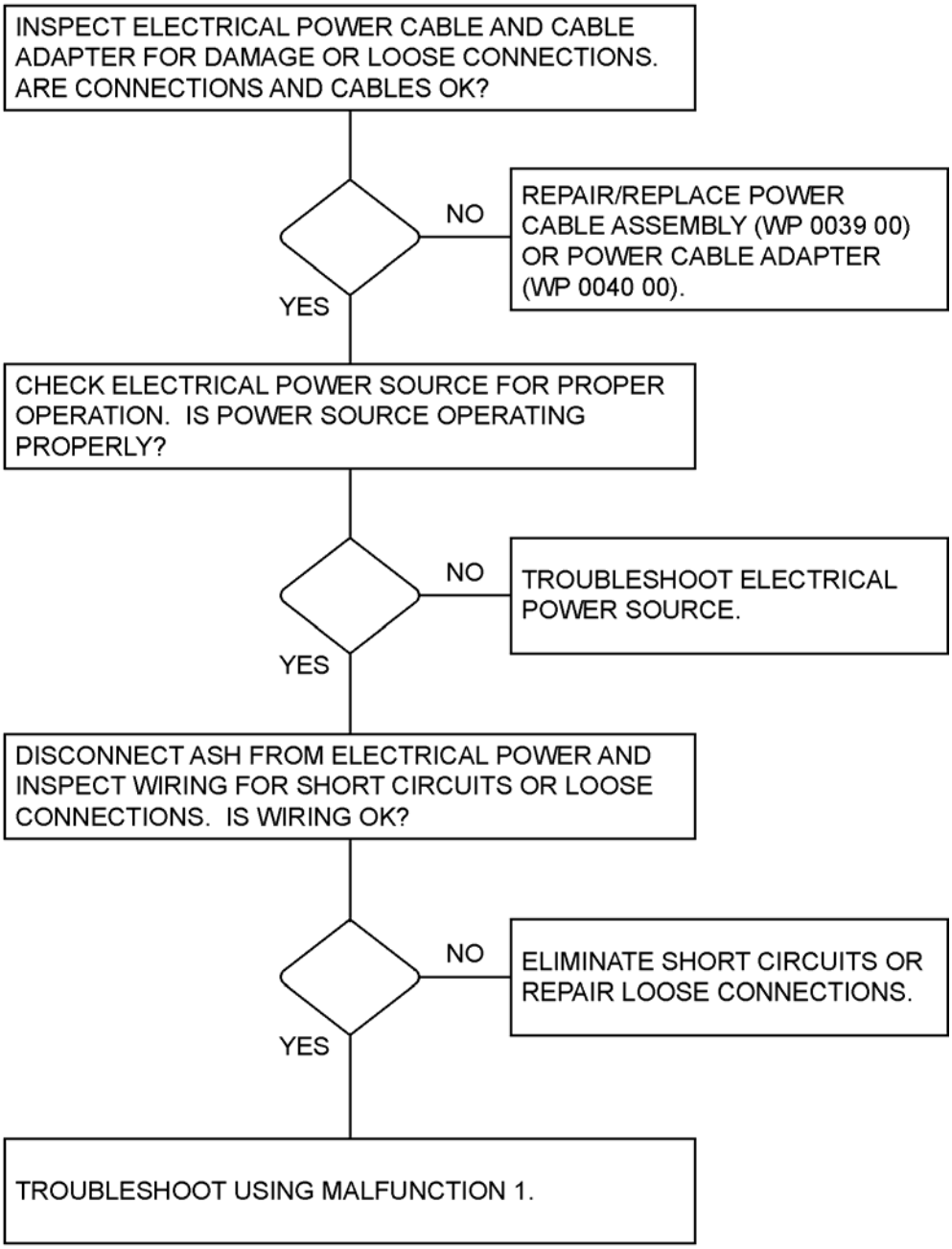
BE CERTAIN that there is someone assisting you who can remove power immediately.

TROUBLESHOOTING PROCEDURES – Continued

Malfunction 9. Ventilation Air Fan Motor Slows Down or Indicator Lights Dim

TROUBLESHOOTING PROCEDURES – Continued

Malfunction 9. Ventilation Air Fan Motor Slows Down or Indicator Lights Dim – Continued



INITIAL SETUP:

Test Equipment
None

Tools and Special Tools
None

Personnel Required
One

References
WP 0005 00
WP 0017 00, table 1

References – Continued
WP 0028 00
WP 0035 00
WP 0036 00
WP 0049 00, table 1
FM 4-25.11

Materials/Parts
None

Equipment Condition
None

WARNING

Heat exchanger overheating may damage the ASH and under some conditions a safety hazard may result. An overheat shutdown occurs when the combustion air and ventilation air fan assemblies are turned off at the same time when in the heating modes. Always set the control panel MODE SWITCH to the VENT position for at least 2 minutes when shutting down the ASH from the heating modes.

FOR ARTIFICIAL RESPIRATION, REFER TO FM 4-25.11, FIRST AID.

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To ensure your safety and that of other maintenance personnel, always observe the following precautions:

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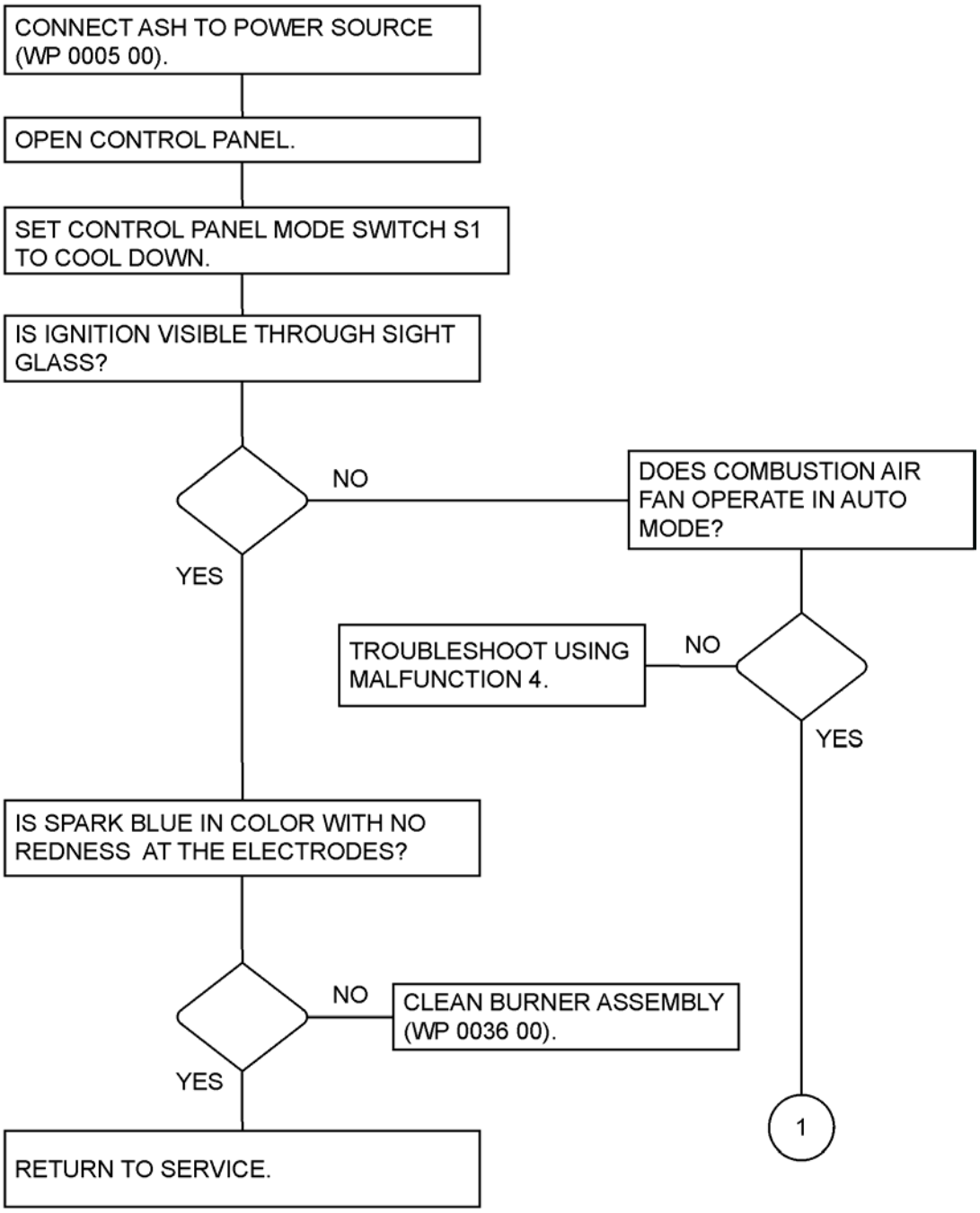
TROUBLESHOOTING PROCEDURES – Continued

Malfunction 10. Improper Spark or No Spark in Igniter

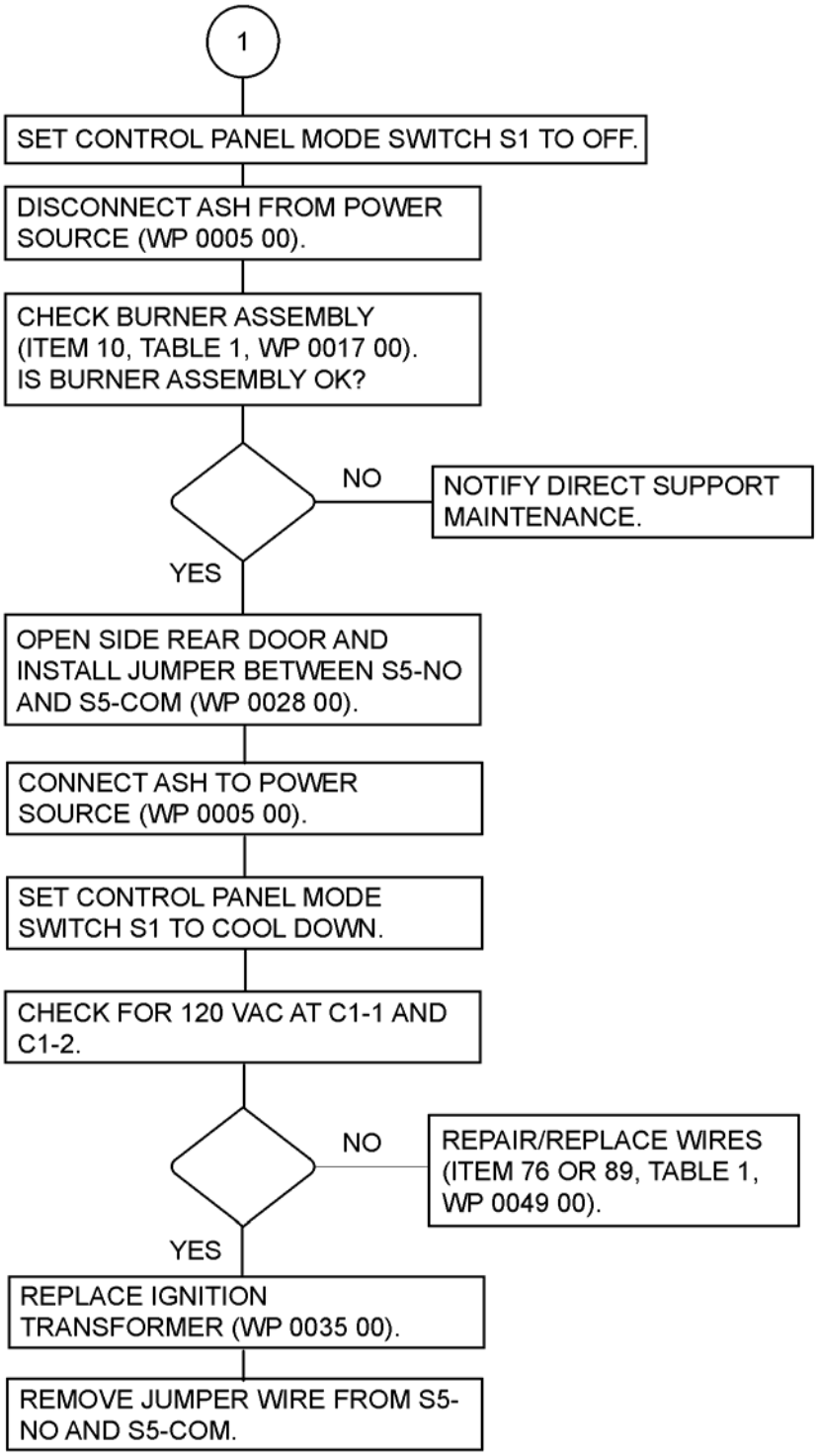
TROUBLESHOOTING PROCEDURES – Continued

Malfunction 10. Improper Spark or No Spark in Igniter – Continued



TROUBLESHOOTING PROCEDURES – Continued

Malfunction 10. Improper Spark or No Spark in Igniter – Continued



INITIAL SETUP:

Test Equipment
None

Tools and Special Tools
None

Personnel Required
One

References
WP 0036 00
FM 4-25.11

Materials/Parts
None

Equipment Condition
None

WARNING

Heat exchanger overheating may damage the ASH and under some conditions a safety hazard may result. An overheat shutdown occurs when the combustion air and ventilation air fan assemblies are turned off at the same time when in the heating modes. Always set the control panel MODE SWITCH to the VENT position for at least 2 minutes when shutting down the ASH from the heating modes.

FOR ARTIFICIAL RESPIRATION, REFER TO FM 4-25.11, FIRST AID.

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To ensure your safety and that of other maintenance personnel, always observe the following precautions:

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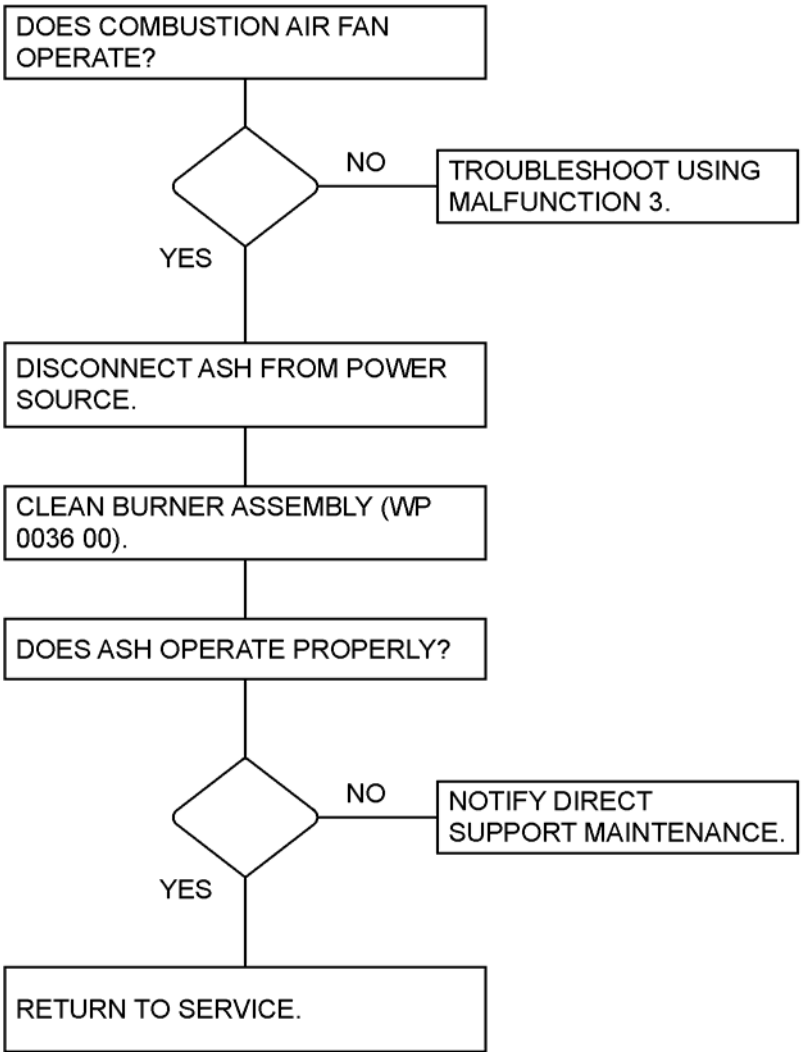
TROUBLESHOOTING PROCEDURES – Continued

Malfunction 11. ASH Backfires or Rumbles in HEAT MANUAL MODE or HEAT AUTO MODE

TROUBLESHOOTING PROCEDURES – Continued

Malfunction 11. ASH Backfires or Rumbles in HEAT MANUAL MODE or HEAT AUTO MODE – Continued



INITIAL SETUP:

Test Equipment
Multimeter (item 1, WP 0058 00)

Tools and Special Tools
None

Personnel Required
One

References
WP 0005 00
WP 0019 00
WP 0025 00

References – Continued
WP 0026 00
WP 0030 00
WP 0034 00
WP 0049 00, table 1
FM 4-25.11

Materials/Parts
None

Equipment Condition
None

WARNING

Heat exchanger overheating may damage the ASH and under some conditions a safety hazard may result. An overheat shutdown occurs when the combustion air and ventilation air fan assemblies are turned off at the same time when in the heating modes. Always set the control panel MODE SWITCH to the VENT position for at least 2 minutes when shutting down the ASH from the heating modes.

Contact with hot components can cause burns. Allow ASH to cool down before attempting service, inspection, or maintenance activity.

FOR ARTIFICIAL RESPIRATION, REFER TO FM 4-25.11, FIRST AID.

Electrical high voltage cannot be seen but can kill you. Electricity is unlike most other dangerous things you can come in contact with because it gives no warning and no symptoms to be wary of. Its effect is immediate. It can kill you, render you unconscious, or severely burn you.

To ensure your safety and that of other maintenance personnel, always observe the following precautions:

DO NOT perform any maintenance on electrical equipment unless all power is removed.

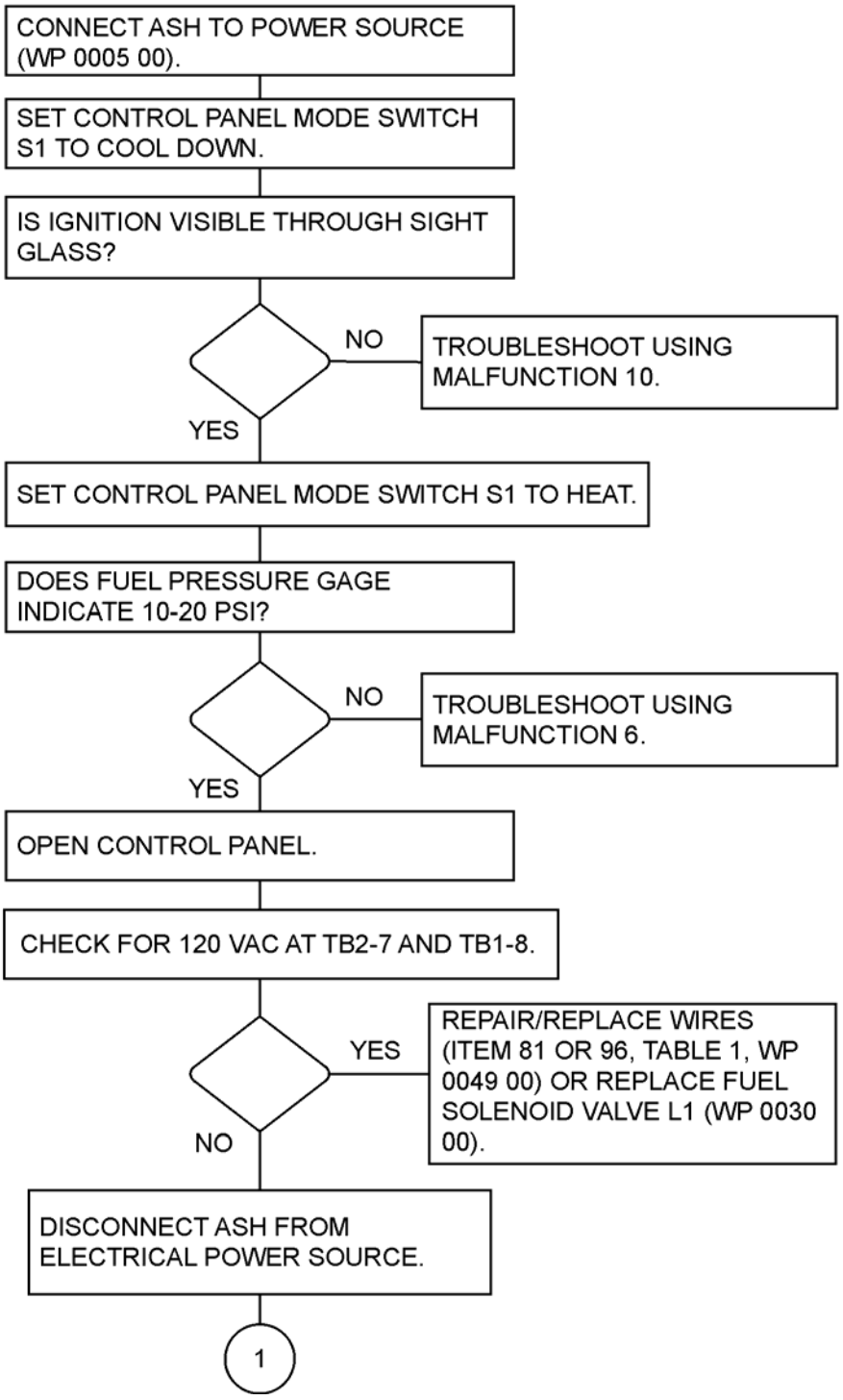
BE CERTAIN that there is someone assisting you who can remove power immediately.

TROUBLESHOOTING PROCEDURES – Continued

Malfunction 12. No Combustion in HEAT MANUAL MODE (FLAME OUT Indicator Is On)

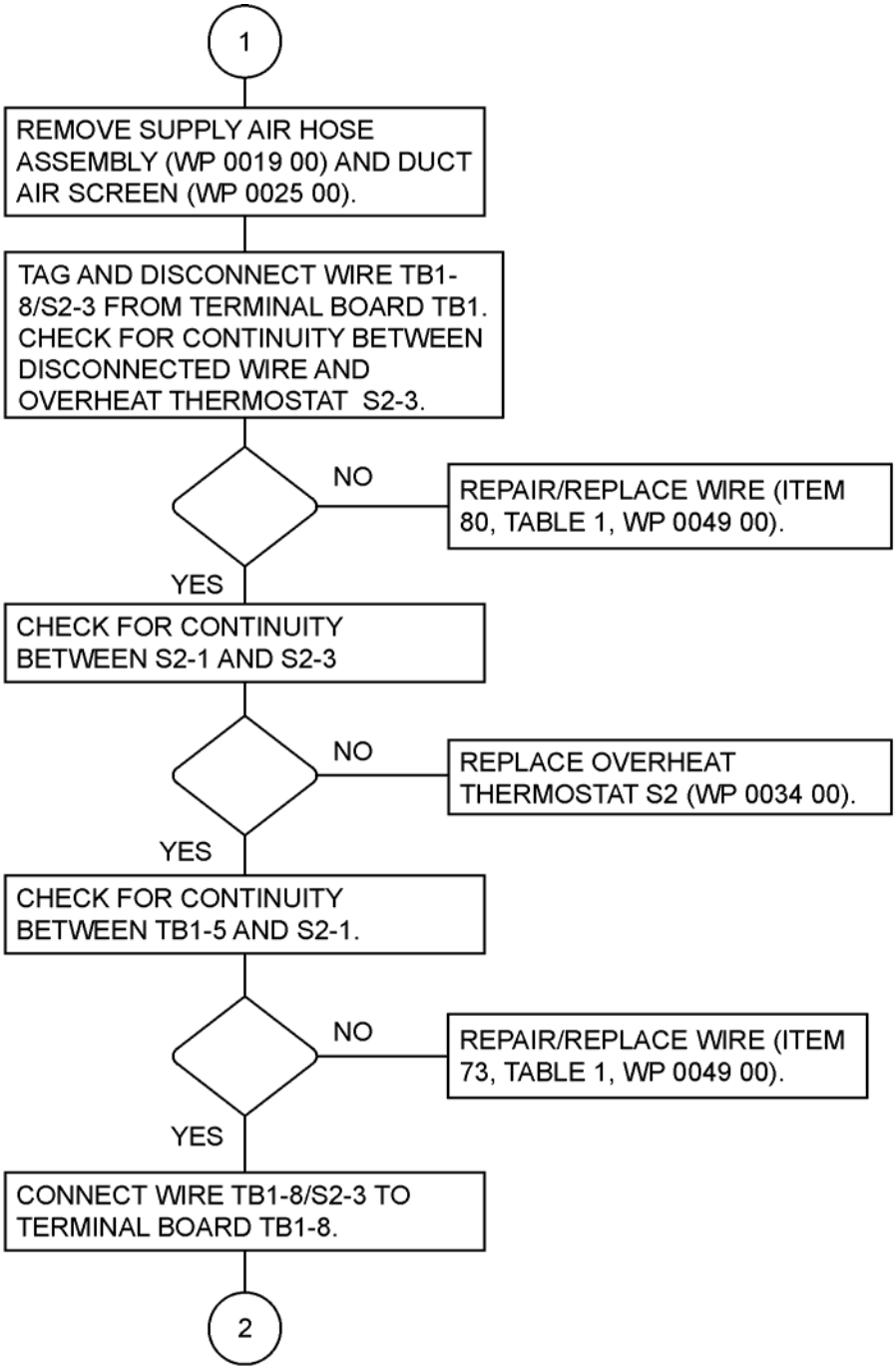
TROUBLESHOOTING PROCEDURES – Continued

Malfunction 12. No Combustion in HEAT MANUAL MODE (FLAME OUT Indicator Is On) – Continued



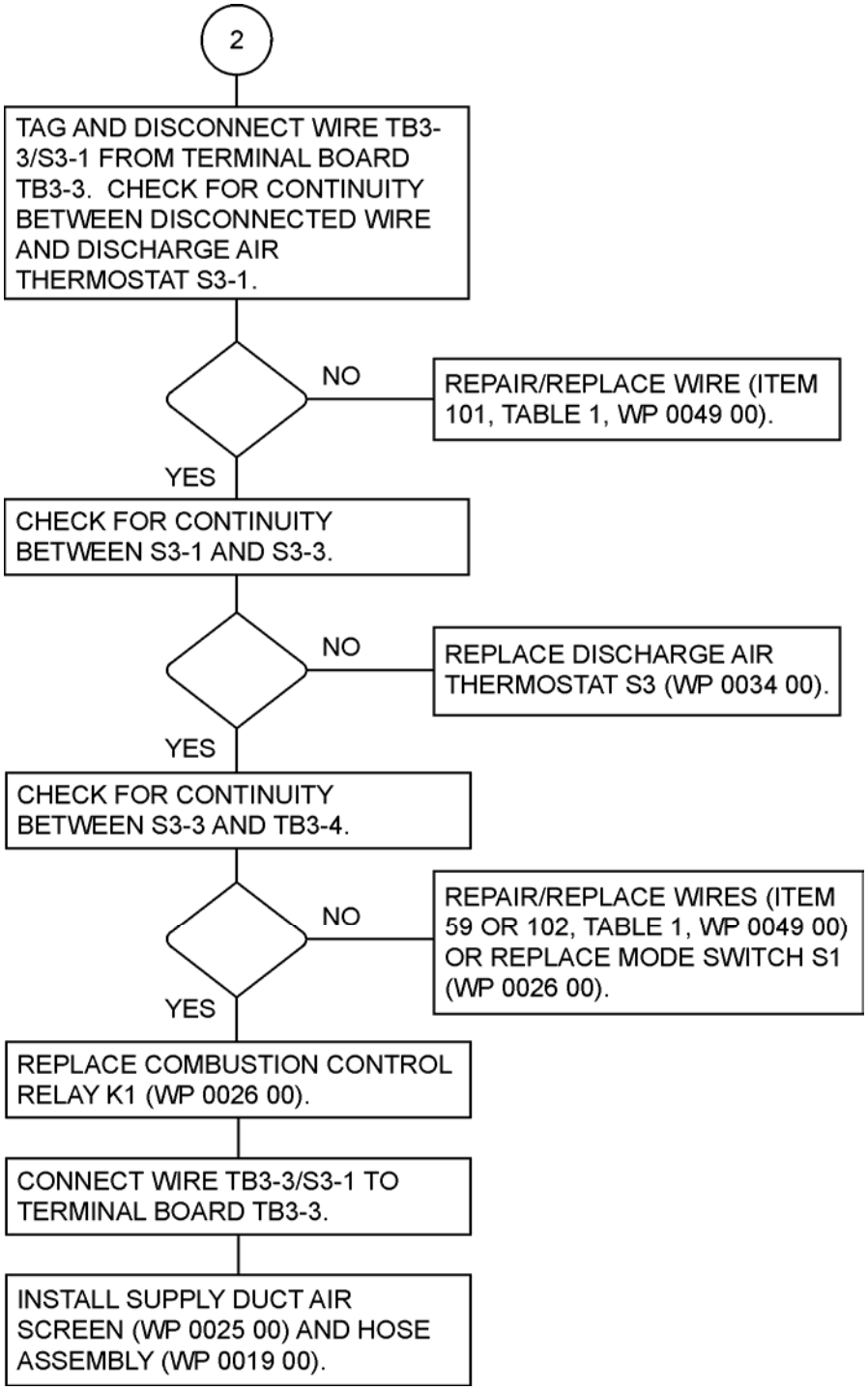
TROUBLESHOOTING PROCEDURES – Continued

Malfunction 12. No Combustion in HEAT MANUAL MODE (FLAME OUT Indicator Is On) – Continued



TROUBLESHOOTING PROCEDURES – Continued

Malfunction 12. No Combustion in HEAT MANUAL MODE (FLAME OUT Indicator Is On) – Continued



INITIAL SETUP:

Test Equipment
Multimeter (item 1, WP 0058 00)

Tools and Special Tools
None

Personnel Required
One

References
WP 0005 00
WP 0026 00

References – Continued
WP 0038 00
WP 0041 00
WP 0049 00, table 1
FM 4-25.11

Materials/Parts
None

Equipment Condition
None

WARNING

Heat exchanger overheating may damage the ASH and under some conditions a safety hazard may result. An overheat shutdown occurs when the combustion air and ventilation air fan assemblies are turned off at the same time when in the heating modes. Always set the control panel MODE SWITCH to the VENT position for at least 2 minutes when shutting down the ASH from the heating modes.

Contact with hot components can cause burns. Allow ASH to cool down before attempting service, inspection, or maintenance activity.

FOR ARTIFICIAL RESPIRATION, REFER TO FM 4-25.11, FIRST AID.

Electrical high voltage cannot be seen but can kill you. Electricity is unlike most other dangerous things you can come in contact with because it gives no warning and no symptoms to be wary of. Its effect is immediate. It can kill you, render you unconscious, or severely burn you.

To ensure your safety and that of other maintenance personnel, always observe the following precautions:

DO NOT perform any maintenance on electrical equipment unless all power is removed.

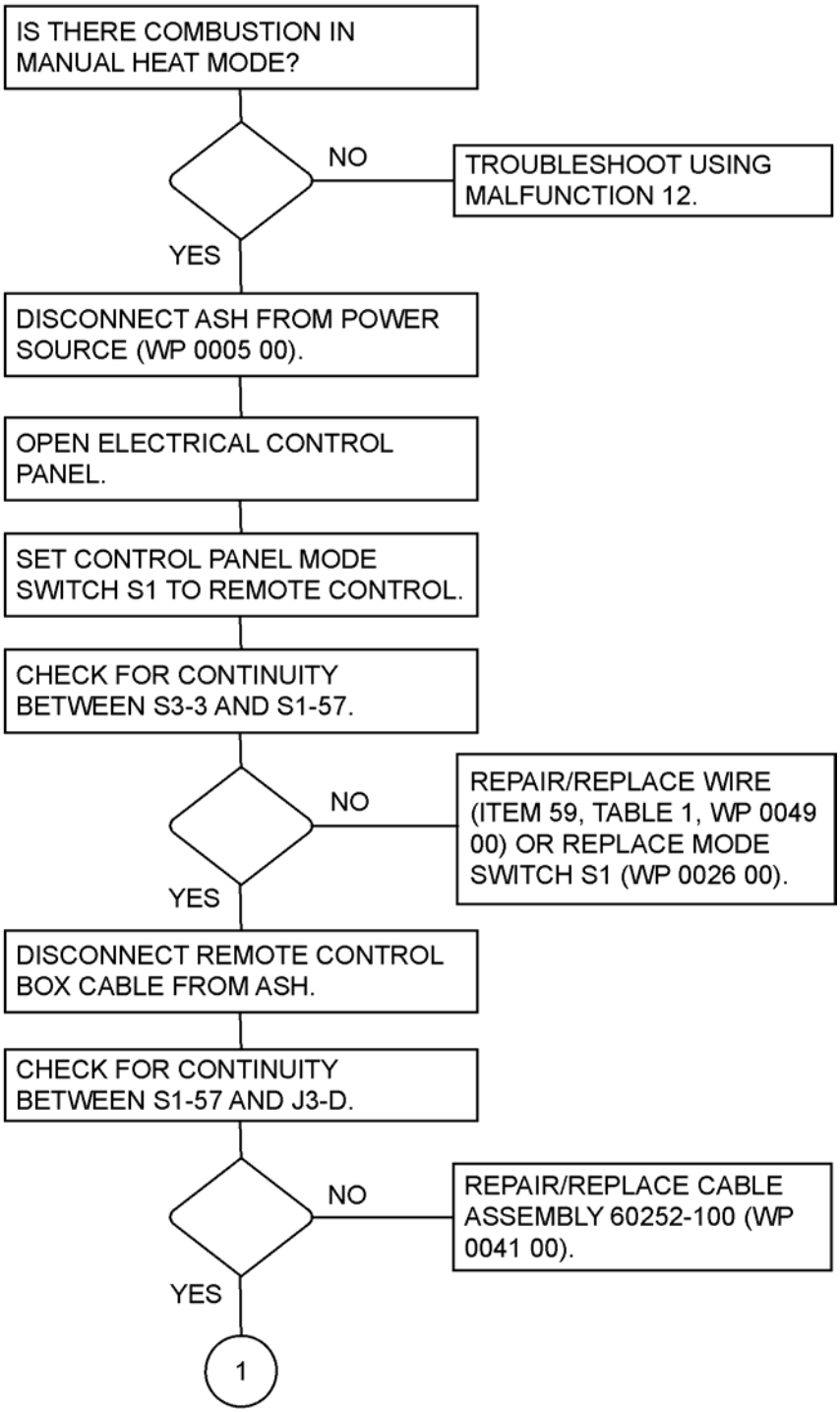
BE CERTAIN that there is someone assisting you who can remove power immediately.

TROUBLESHOOTING PROCEDURES – Continued

Malfunction 13. No Combustion in HEAT AUTO MODE (FLAME OUT Indicator Is On)

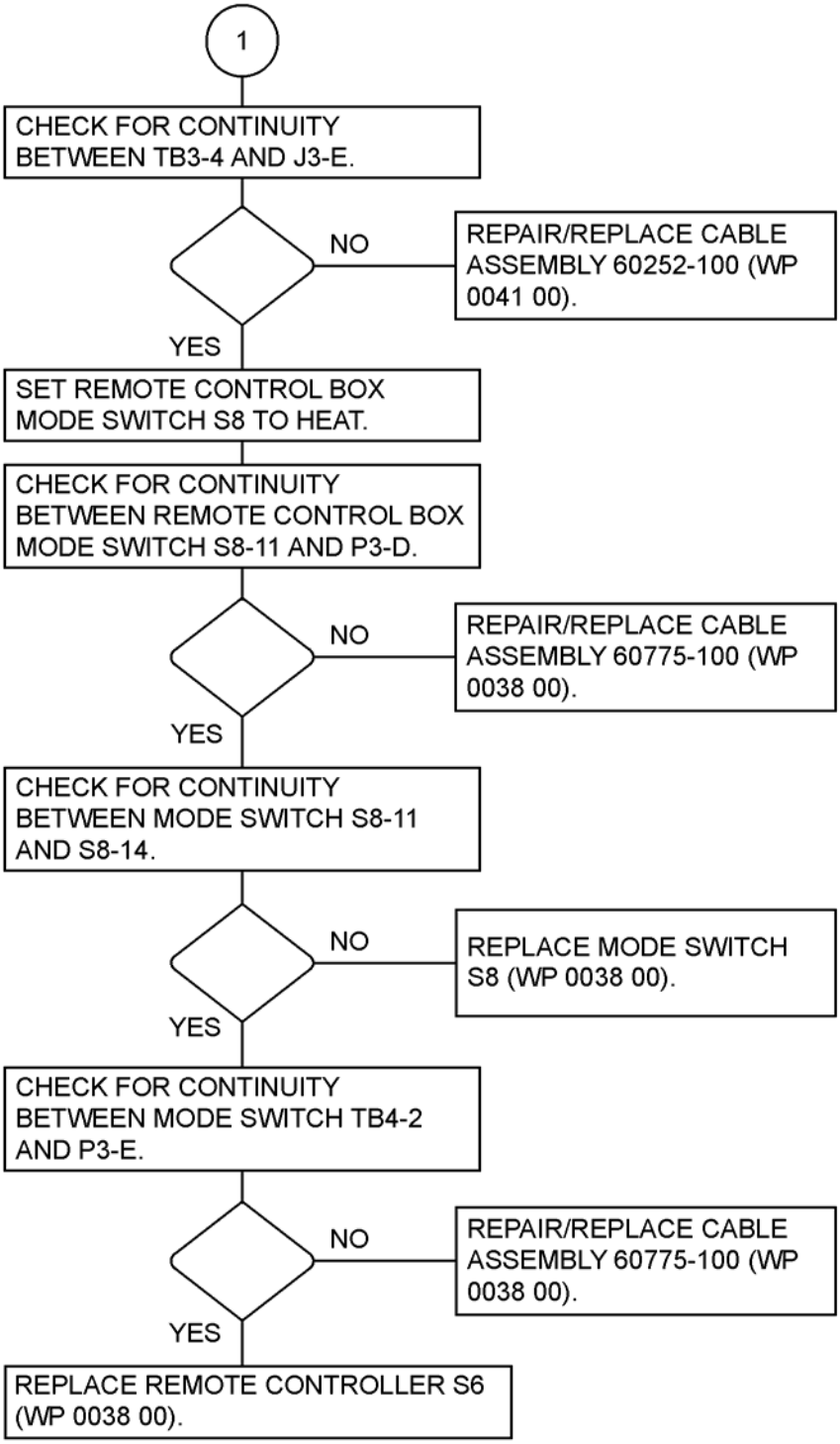
TROUBLESHOOTING PROCEDURES – Continued

Malfunction 13. No Combustion in HEAT AUTO MODE (FLAME OUT Indicator Is On) – Continued



TROUBLESHOOTING PROCEDURES – Continued

Malfunction 13. No Combustion in HEAT AUTO MODE (FLAME OUT Indicator Is On) – Continued



INITIAL SETUP:

Test Equipment
None

Tools and Special Tools
None

Personnel Required
One

References
WP 0017 00, table 1
WP 0026 00
WP 0038 00
FM 21-11

Materials/Parts
None

Equipment Condition
None

WARNING

Heat exchanger overheating may damage the ASH and under some conditions a safety hazard may result. An overheat shutdown occurs when the combustion air and ventilation air fan assemblies are turned off at the same time when in the heating modes. Always set the control panel MODE SWITCH to the VENT position for at least 2 minutes when shutting down the ASH from the heating modes.

FOR ARTIFICIAL RESPIRATION, REFER TO FM 4-25.11, FIRST AID.

Electrical high voltage cannot be seen but can kill you. Electricity is unlike most other dangerous things you can come in contact with because it gives no warning and no symptoms to be wary of. Its effect is immediate. It can kill you, render you unconscious, or severely burn you.

To ensure your safety and that of other maintenance personnel, always observe the following precautions:

DO NOT perform any maintenance on electrical equipment unless all power is removed.

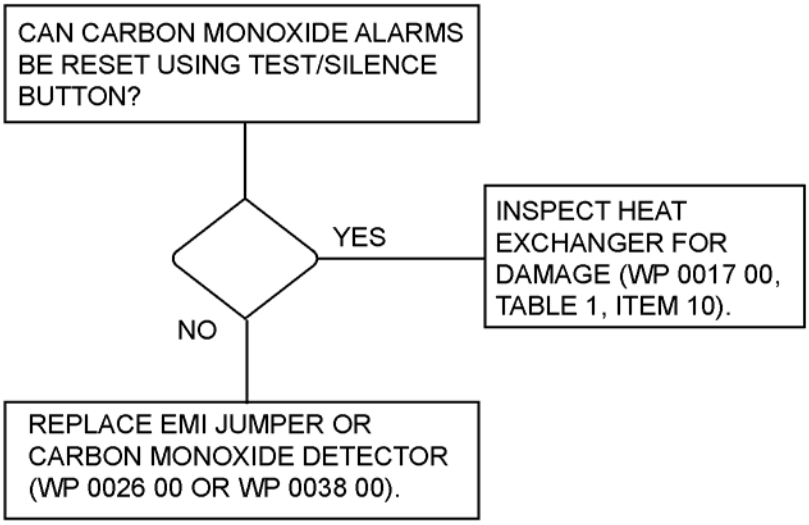
BE CERTAIN that there is someone assisting you who can remove power immediately.

TROUBLESHOOTING PROCEDURES

Malfunction 14. CARBON MONOXIDE ALARMS Sound and Light

TROUBLESHOOTING PROCEDURES – Continued

Malfunction 14. CARBON MONOXIDE ALARMS Sound and Light – Continued



END OF WORK PACKAGE

CHAPTER 5

OPERATOR MAINTENANCE INSTRUCTIONS FOR ARMY SPACE HEATER H-140

OPERATOR MAINTENANCE INSTRUCTIONS

ARMY SPACE HEATER H-140

NSN 4520-01-477-0568

PREVENTIVE MAINTENANCE CHECKS AND SERVICES (PMCS) INTRODUCTION

INTRODUCTION

PMCS are performed to keep the ASH in operating condition. Inspect the ASH within specified intervals so defects are found and corrected or problems are reported before any serious damage or failure occurs. Do the PMCS per the PMCS work package (WP 0014 00). Pay attention to WARNING and CAUTION statements. A WARNING means someone could be hurt. A CAUTION means equipment could be damaged.

NOTE

Designated intervals are performed under usual operating conditions. PMCS intervals must be performed more frequently when operating under unusual conditions.

1. Be sure to perform your PMCS each time you operate the equipment. Always do your PMCS in the same order so that it gets to be a habit. Once you have had some practice, you will quickly spot anything wrong.

2. Do your BEFORE (B) PMCS just before you operate the equipment. Pay attention to WARNING, CAUTION, and NOTE statements.

3. Do your DURING (D) PMCS while you operate the equipment. During operation means to monitor the equipment and its related components while it is actually being operated. Pay attention to WARNING, CAUTION, and NOTE statements.

4. Do your AFTER (A) PMCS right after operating the equipment. Pay attention to WARNING, CAUTION, and NOTE statements.

5. Do your WEEKLY (W) PMCS once a week.

6. Do your MONTHLY (M) PMCS once a month.

7. If you find something wrong when performing the PMCS, fix it if you can using the Operational Checkout and Troubleshooting Procedures work package (WP 0010 00).

8. If anything looks wrong and you cannot repair it, write it on your DA Form 2404. Report it immediately to your supervisor.

EXPLANATION OF COLUMNS IN THE PMCS

1. The ITEM column is a numeric listing of the order in which you are to do the check or service.

2. The INTERVAL column tells you when to do a certain check or service.

3. The ITEM TO BE CHECKED OR SERVICED column tells you what equipment to check or service.

4. The PROCEDURE column tells you how to do the required check or service. Carefully follow these instructions. If you do not have tools, or if the procedure tells you to, notify your supervisor.

PMCS PROCEDURES – Continued

NOTE

The terms ready/available and mission capable refer to the same status: Equipment is on hand and ready to perform its combat missions. Refer to DA PAM 738-750.

5. The EQUIPMENT IS NOT READY/AVAILABLE IF: column tells you when your equipment is not mission capable and why the equipment cannot be used.

INSPECTION

Look for signs of a problem or trouble. Listen for unusual noise, clinking, rubbing, or squealing and watch and feel for unusual shaking or vibration. Be alert when in or around the ASH.

Inspect the ASH to see if items are in good condition. Are they correctly assembled, stowed, and secured; excessively worn, leaking, or corroded; or properly lubricated? Correct any problems found or notify your supervisor.

The following are checks that are common to all equipment:

WARNING

Cleaning compound solvent vapors are toxic. Avoid prolonged or repeated breathing of vapors or solvent contact with skin. Use only with adequate ventilation. Solvent is flammable and should not be used near open flame. Be sure a fire extinguisher is available.

1. Keep It Clean. Dirt, grease, oil, and debris only get in the way and may cover up a serious problem. Clean as you work and as needed. Use cleaning compound solvent (item 3, WP 0061 00) on all metal surfaces. Use soap and water when you clean rubber or plastic material.

2. Rust and Corrosion. Check equipment for rust and corrosion. If you find any bare metal or that corrosion exists, clean and apply a thin coat of lubricating oil (item 12, WP 0061 00). Report it to your supervisor.

3. Bolts, Screws, and Nuts. Check for looseness and missing, bent, or broken condition. Look for chipped paint, bare metal, rust, or corrosion around bolt and screw heads and nuts. If you find a bolt, screw, or nut you think is loose, report it to your supervisor.

4. Welds. Look for loose or chipped paint, rust, corrosion, or gaps where parts are welded together. If you find a bad weld, report it to your supervisor.

5. Electrical Wires and Connectors. Look for cracked, frayed, or broken insulation; bare wires; and loose or broken connectors. If you find any damaged wires, report it to your supervisor.

6. Hoses and Fluid Lines. Look for wear, damage, and leaks. Ensure that clamps and fittings are tight. Wet spots show leaks, but a stain around a fitting or connector can also mean a leak. If a leak comes from a loose fitting or connector, report it to your supervisor. If something is broken or worn out, report it to your supervisor.

7. Hinges. Check hinges for security and smooth operation. If you find a problem, report it to your supervisor.

8. Data Plates. Check data plates, caution, and warning plates for security and legibility. If you find a problem, report it to your supervisor.

CLEANING

WARNING

DO NOT use diesel fuel, gasoline, or benzene (benzol) for cleaning.

DO NOT SMOKE when using cleaning solvents. NEVER USE CLEANING SOLVENTS NEAR AN OPEN FLAME. Be sure a fire extinguisher is available. Use cleaning solvents only in well-ventilated areas. The flash point of cleaning solvent is 138°F (60°C).

USE CARE when using cleaning solvents. Cleaning solvents evaporate quickly and can irritate exposed skin if solvents contact skin. In cold weather, contact of exposed skin with cleaning solvents can cause frostbite.

Cleaning compound solvent vapors are toxic. Avoid prolonged or repeated breathing of vapors or solvent contact with skin. Use only with adequate ventilation. Solvent is flammable and should not be used near open flame. Be sure a fire extinguisher is available.

Clean grease, rust, or fuel buildup or rusty places. Use cleaning compound solvent (item 3, WP 0061 00), then apply a thin coat of lubricating oil (item 12, WP 0061 00) to affected area, and use wiping rags (item 14, WP 0061 00).

LEAKAGE DEFINITIONS

It is necessary for you to know how fluid leakage affects the status of the ASH. Following are types/classes of leakage that you need to know to be able to determine the status of the ASH. Learn these leakage definitions and remember when in doubt, notify your supervisor.

CAUTION

Equipment operation is allowed with minor leakages (Class I or II). Consideration must be given to fluid capacity in the item/system being checked/inspected. When in doubt, notify your supervisor.

When operating with Class I or II leaks, continue to check fluid levels as required in the PMCS.

Class III leaks should be reported immediately to your supervisor.

CLASS I – Seepage of fluid (as indicated by wetness or discoloration) not great enough to form drops.

CLASS II – Leakage of fluid great enough to form drops but not enough to cause drops to drip from item being checked/inspected.

CLASS III – Leakage of fluid great enough to form drops that fall from item being checked/inspected.

END OF WORK PACKAGE

OPERATOR MAINTENANCE INSTRUCTIONS

ARMY SPACE HEATER H-140

NSN 4520-01-477-0568

PMCS

INITIAL SETUP:

Test Equipment
None

Tools and Special Tools
None

Personnel Required
One

References
WP 0008 00
FM 10-67-1

Materials/Parts
Pressure sensitive tape (item 26, WP 0061 00)

Equipment Condition
None

WARNING

Heat exchanger overheating may damage the ASH and under some conditions a safety hazard may result. An overheat shutdown occurs when the combustion air and ventilation air fan assemblies are turned off at the same time when in the heating modes. Always set the control panel MODE SWITCH to the VENT position for at least 2 minutes when shutting down the ASH from the heating modes.

Contact with hot components can cause burns. Allow ASH to cool down before attempting service, inspection, or maintenance activity.

FOR FUEL SPILLS, REFER TO FM 10-67-1, CONCEPTS AND EQUIPMENT OF PETROLEUM OPERATIONS.

Fuel is flammable and toxic to eyes, skin, and respiratory tract. Skin/eye protection is required. Avoid repeated/prolonged contact. Use only in well-ventilated areas. Keep away from open flames or other sources of ignition. Post FUEL FLAMMABLE/NO SMOKING signs around the area. Be sure a fire extinguisher is available.

Fuel on clothing can be fatal if ignited by a static discharge. If fuel gets on clothes, leave the refueling area as soon as possible, remove clothes, and wash skin with warm, soapy water before getting dressed.

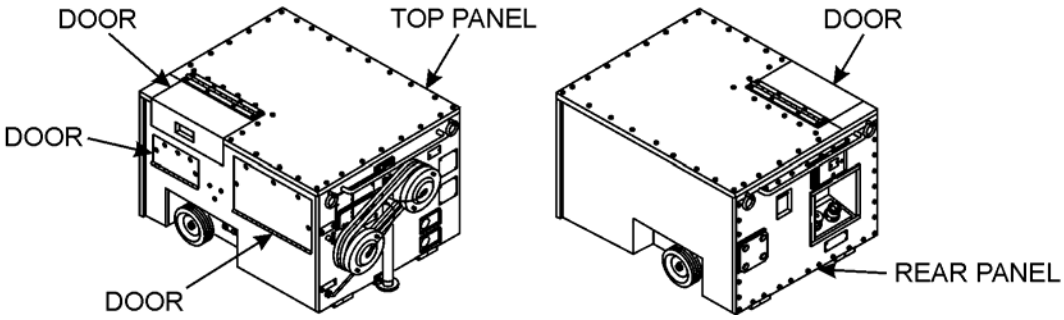
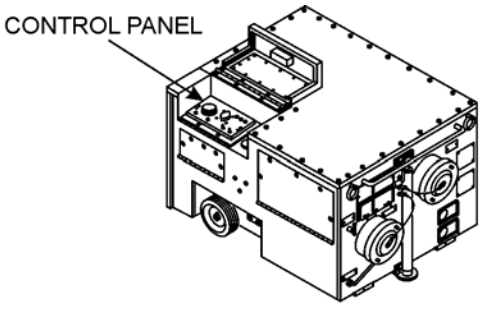
Spilled fuel creates a flammable, vapor-air mixture and fire can take place. Improper positioning of external fuel source can cause fuel tank to overflow. Stop refueling immediately if fuel spill occurs.

PMCS

Table 1 provides operator PMCS for the ASH.

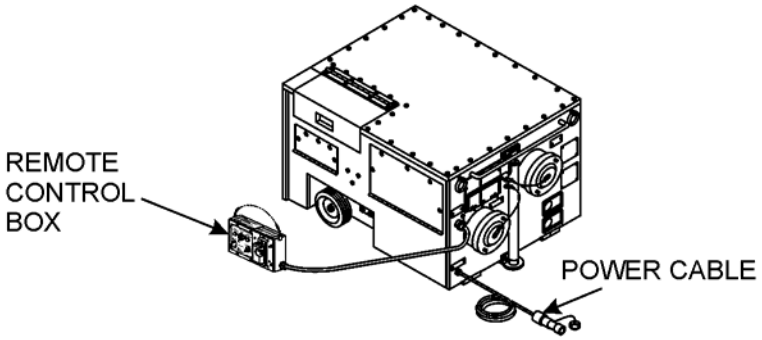
PMCS – Continued

Table 1. Operator PMCS.

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
			EXTERNAL	
1	Before	Access Doors and Top and Rear Panels	1. Inspect for loose or missing hardware. 2. Inspect for broken hinges, latches, stays, and dents or holes.	Missing doors or panels. Holes.
				
2	Before	Control Panel	1. Inspect for loose or missing hardware. 2. Inspect for broken or missing knobs, gages, or switches. 	Broken or missing knobs, gages, or switches.

PMCS – Continued

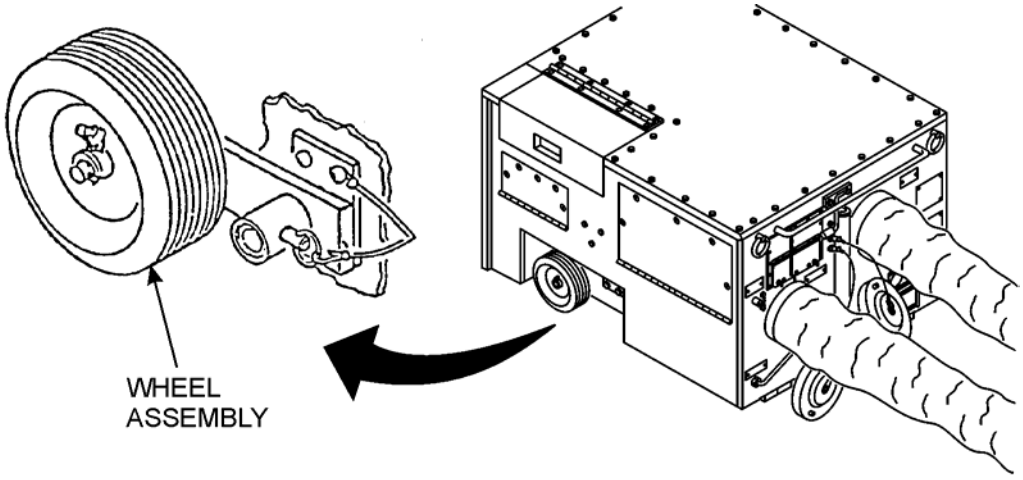
Table 1. Operator PMCS – Continued.

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
			EXTERNAL – Continued	
3	Before	Power Cable and Remote Control Box Cable (WP 0008 00, Stowage Locations)	1. Inspect for frayed or cracked insulation and cracked, bent, or broken connectors. 2. Inspect for cracks, wear, or foreign objects on cable connector. 	Exposed wires or damaged connectors.

PMCS – Continued

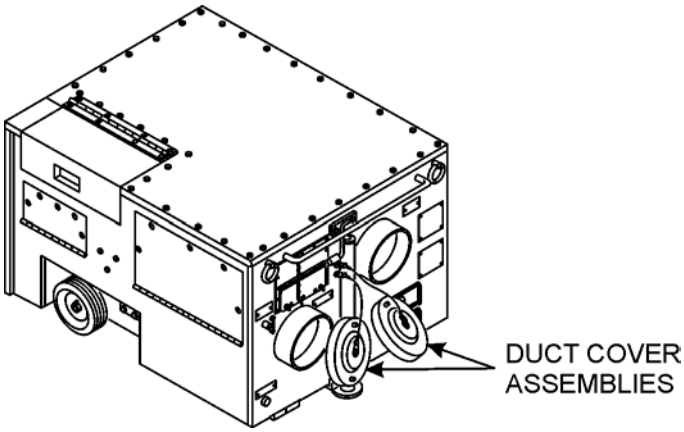
Table 1. Operator PMCS – Continued.

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
			EXTERNAL – Continued	
4	Before	Wheel Assemblies	1. Inspect for wear, cuts, or damage.	Damaged tire or wheel assembly.
			2. Inspect for movement of wheel on axle and axle movement on pivot.	
			3. Inspect for missing or damaged bolts or lock pins.	Missing or damaged bolts, or lock pins.



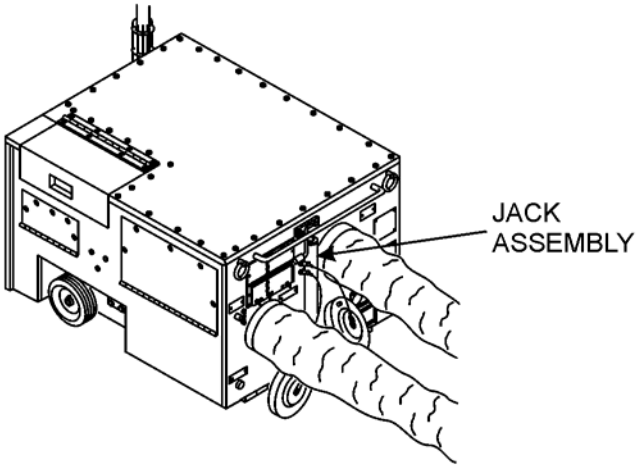
PMCS – Continued

Table 1. Operator PMCS – Continued.

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
			EXTERNAL – Continued	
5	Before	Supply and Return Duct Cover Assemblies	1. Inspect for missing covers. 2. Inspect for cracks, holes, or bent covers. 3. Inspect for security of chain. 4. Ensure that covers have been removed from both locations. 	Missing or damaged covers or chain.

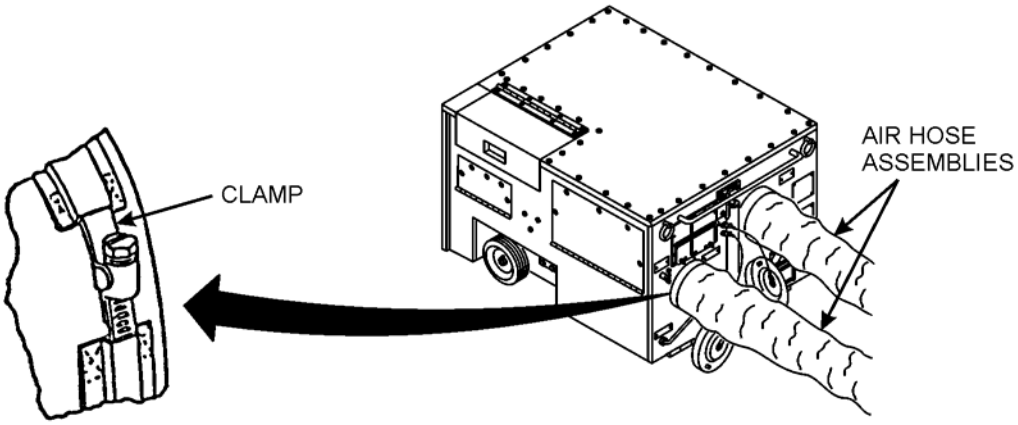
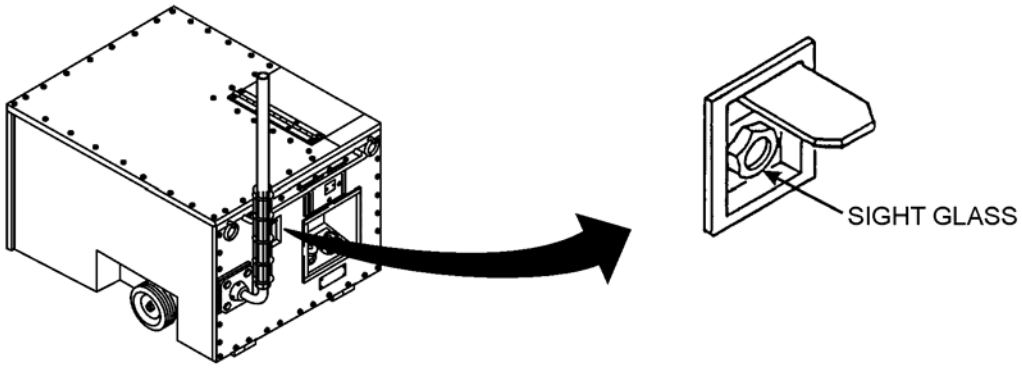
PMCS – Continued

Table 1. Operator PMCS – Continued.

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
			EXTERNAL – Continued	
6	Before	Jack Assembly	1. Inspect for missing or damaged hardware.	Missing or damaged hardware.
			2. Inspect for ease of movement and ability to lift front of ASH with jack assembly.	Inoperative jack assembly.
				

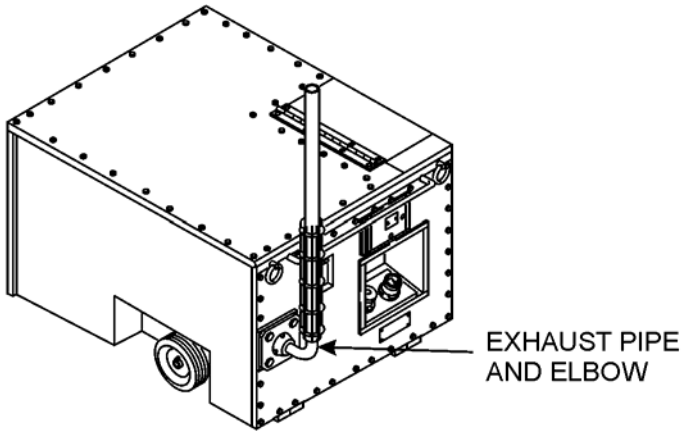
PMCS – Continued

Table 1. Operator PMCS – Continued.

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
			EXTERNAL – Continued	
7	Before	Supply and Return Air Hose Assemblies	1. Inspect for holes or tears in fabric.	Holes or tears in fabric.
			2. Inspect for wear and sharp edges on clamps.	
			3. Inspect for missing, broken, or loose clamps.	Missing, loose, or broken clamps.
			4. Apply pressure sensitive tape (item 26, WP 0061 00) to minor holes or tears in fabric.	
				
8	Before	Sight Glass	Inspect for dirty or rusty and cracked or missing glass.	Cracked or missing glass.
				

PMCS – Continued

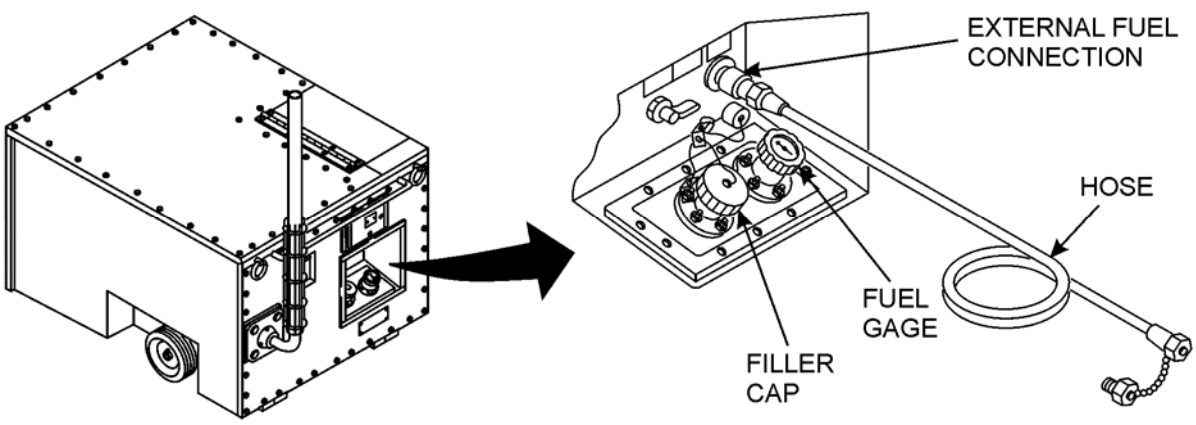
Table 1. Operator PMCS – Continued.

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
			EXTERNAL – Continued	
9	Before	Exhaust Pipe and Elbow	1. Inspect for cracks, holes, corrosion, or improper fit. 2. Inspect for missing or damaged captive bolts. 3. Inspect for loose, missing, or damaged guard. 	Improper fit, cracks or holes. Damaged or missing captive bolts.

PMCS – Continued

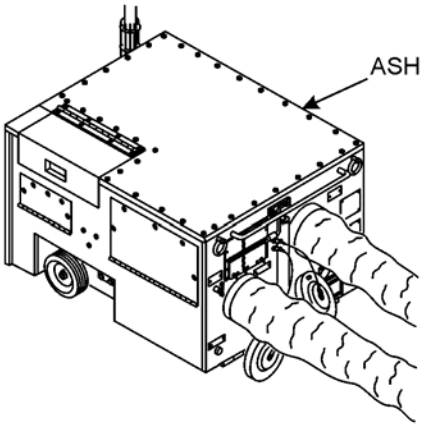
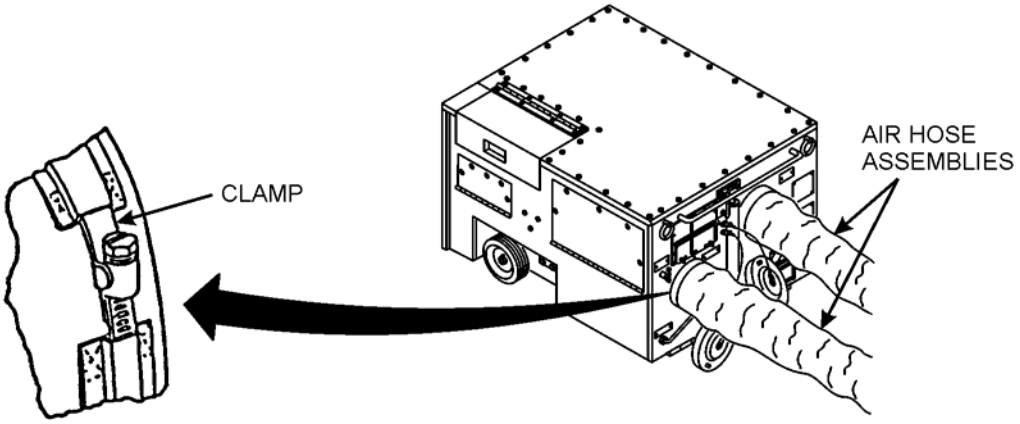
Table 1. Operator PMCS – Continued.

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
			EXTERNAL – Continued	
10	Before	External Fuel Connection and Hose	1. Inspect for missing dust cap.	
			2. Inspect for damage, corrosion, or leaks on fitting.	Damaged threads or leaks.
			3. Inspect for wear or leaks on hose.	Leaks.
11	Before	Fuel Gage and Filler Cap	1. Inspect for broken glass, bent or broken pointer, and corrosion.	Leaks.
			2. Inspect for leaks in fuel gage and filler cap.	Leaks.
			3. Remove filler cap and inspect for holes or foreign objects in screen.	



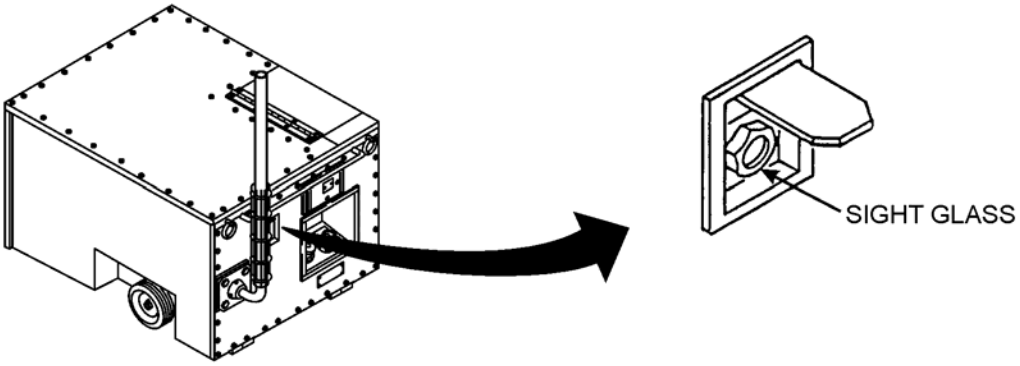
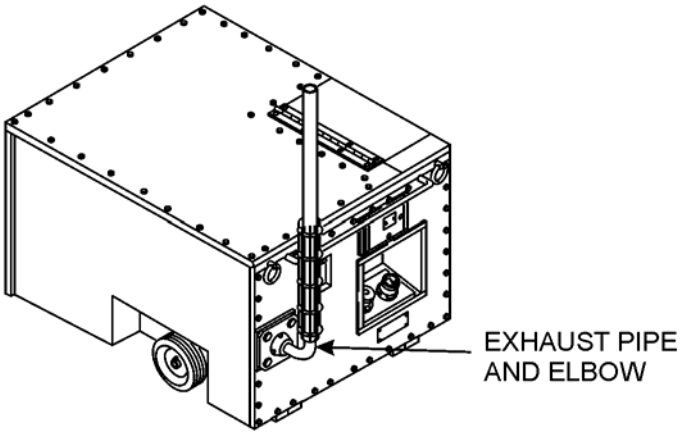
PMCS – Continued

Table 1. Operator PMCS – Continued.

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
			EXTERNAL – Continued	
12	During	ASH	Inspect for unusual noises or vibrations. 	Unusual noises or vibrations.
13	During	Supply and Return Air Hose Assemblies	1. Inspect for holes or tears in fabric. 2. Inspect for wear and sharp edges on clamps. 3. Inspect for missing, broken, or loose clamps. 4. Apply pressure sensitive tape (item 26, WP 0061 00) to minor holes or tears in fabric. 	Holes or tears in fabric. Missing, loose, or broken clamps.

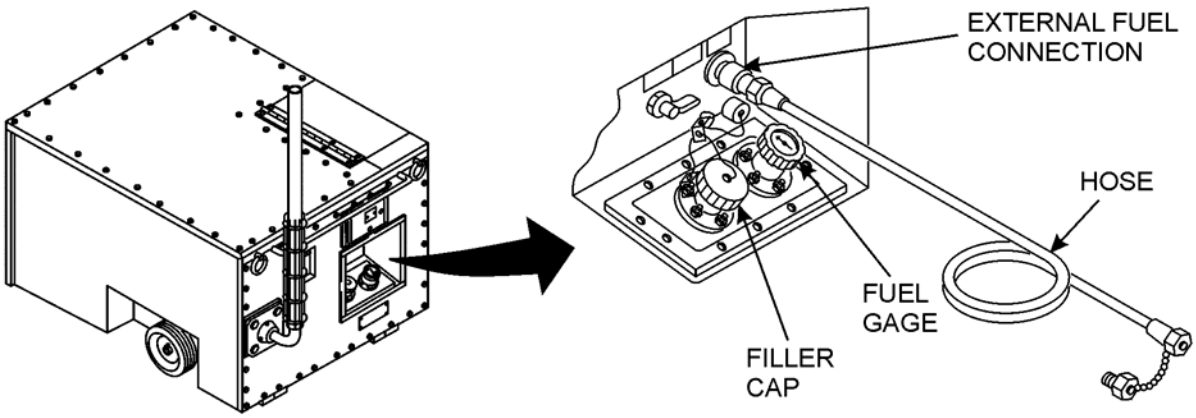
PMCS – Continued

Table 1. Operator PMCS – Continued.

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
			EXTERNAL – Continued	
14	During	Sight Glass	Inspect for dirt or soot and cracked or missing glass.	Cracked or missing glass.
				
15	During	Exhaust Pipe and Elbow	1. Inspect for cracks or holes and loose or missing guard. 2. Inspect for loose or missing captive bolts.	Cracks or holes. Loose or missing captive bolts.
				

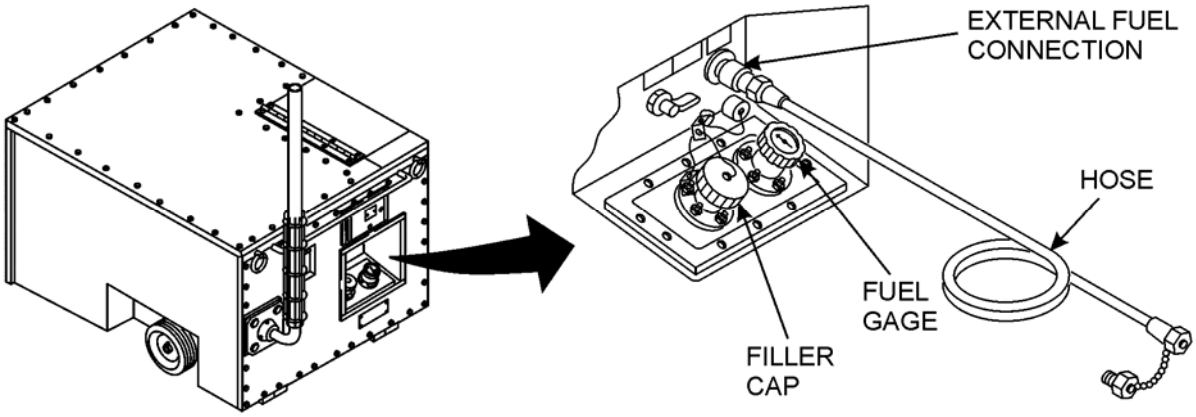
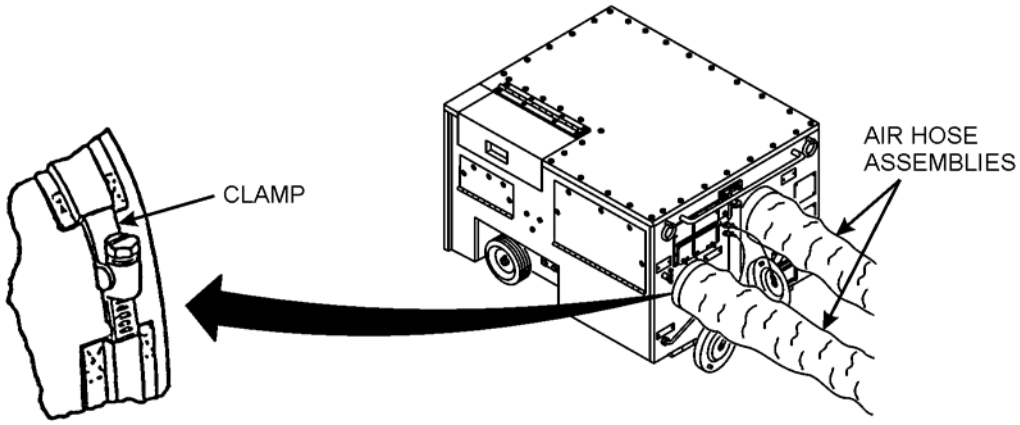
PMCS – Continued

Table 1. Operator PMCS – Continued.

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
			EXTERNAL – Continued	
16	During	External Fuel Connection and Hose, Fuel Gage, and Filler Cap	Inspect for leaks.	Leaks.
				
17	After	External Fuel Connection and Hose	1. Inspect for missing dust cap.	
			2. Inspect for damage, corrosion, or leaks on fittings.	Damaged threads or leaks.
			3. Inspect for wear or leaks on hose.	Leaks.
18	After	Fuel Gage and Filler Cap	1. Inspect for broken glass, bent or broken pointer, and corrosion.	Broken glass or pointer.
			2. Inspect for leaks in fuel gage and filler cap.	Any leaks.
			3. Remove filler cap and inspect for holes or foreign objects in screen.	Damaged screen.

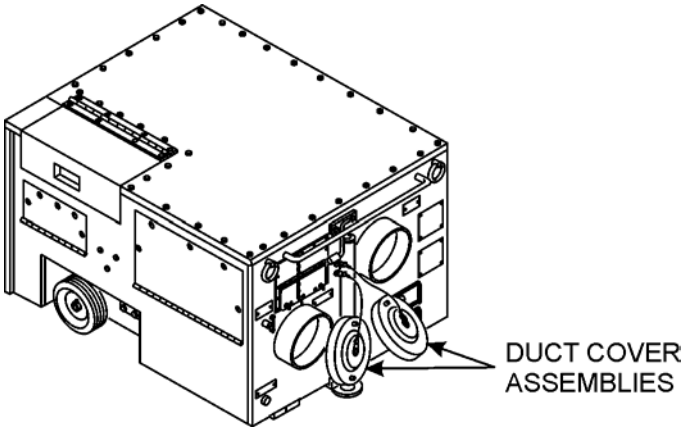
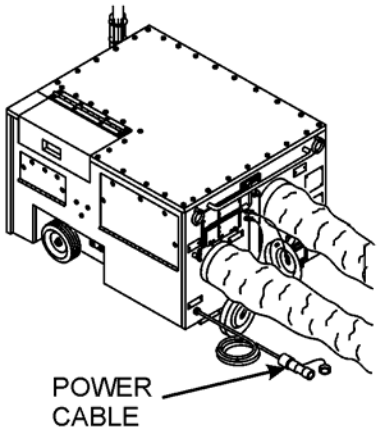
PMCS – Continued

Table 1. Operator PMCS – Continued.

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
EXTERNAL – Continued				
18 – Cont'd				
19	After	Supply and Return Air Hose Assemblies	1. Inspect for holes or tears in fabric. 2. Inspect for proper operation and wear and sharp edges on clamps. 3. Apply pressure sensitive tape (item 26, WP 0061 00) to minor holes or tears in fabric.	Holes or tears in fabric. Inoperative clamps.
				

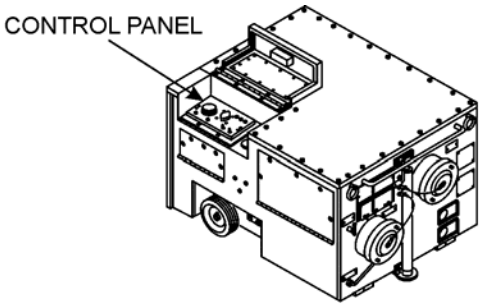
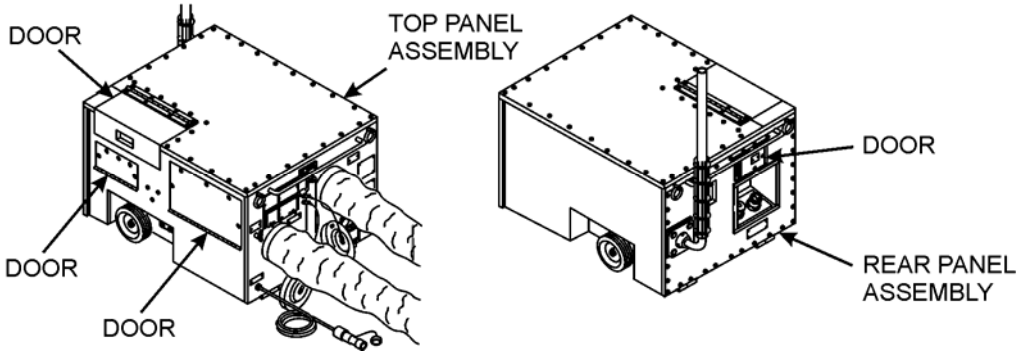
PMCS – Continued

Table 1. Operator PMCS – Continued.

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
			EXTERNAL – Continued	
20	After	Supply and Return Duct Cover Assemblies	1. Inspect for missing covers. 2. Inspect for proper fit over ports. 3. Inspect for damaged covers. 4. Inspect for security of chain. 	Missing or damaged covers or chain.
21	After	Power Cable (WP 0008 00, Stowage Locations)	1. Inspect for frayed or cracked insulation and cracked, bent, broken, or burnt connectors. 2. Inspect for cracks, wear, or foreign objects on cable connector. 	Exposed wires or damaged or burnt connec-tors.

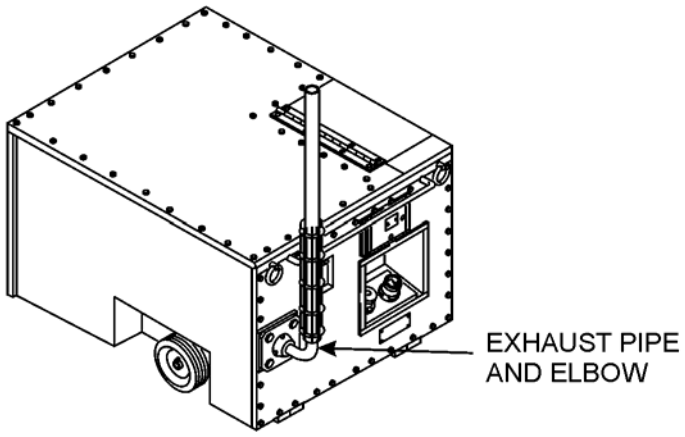
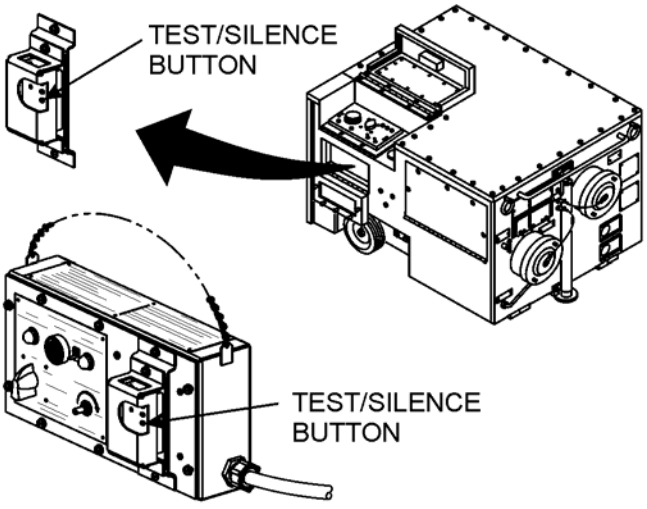
PMCS – Continued

Table 1. Operator PMCS – Continued.

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
			EXTERNAL – Continued	
22	After	Control Panel	1. Inspect for loose or missing hardware. 2. Inspect for broken or missing knobs, gages, or switches. 	Broken or missing knobs, gages, or switches.
23	After	Access Doors and Top and Rear Panels	1. Inspect for loose or missing doors, panels, or hardware. 2. Inspect for loose, broken, bent or missing hinges, latches, or stays. 	Missing doors or panels.

PMCS – Continued

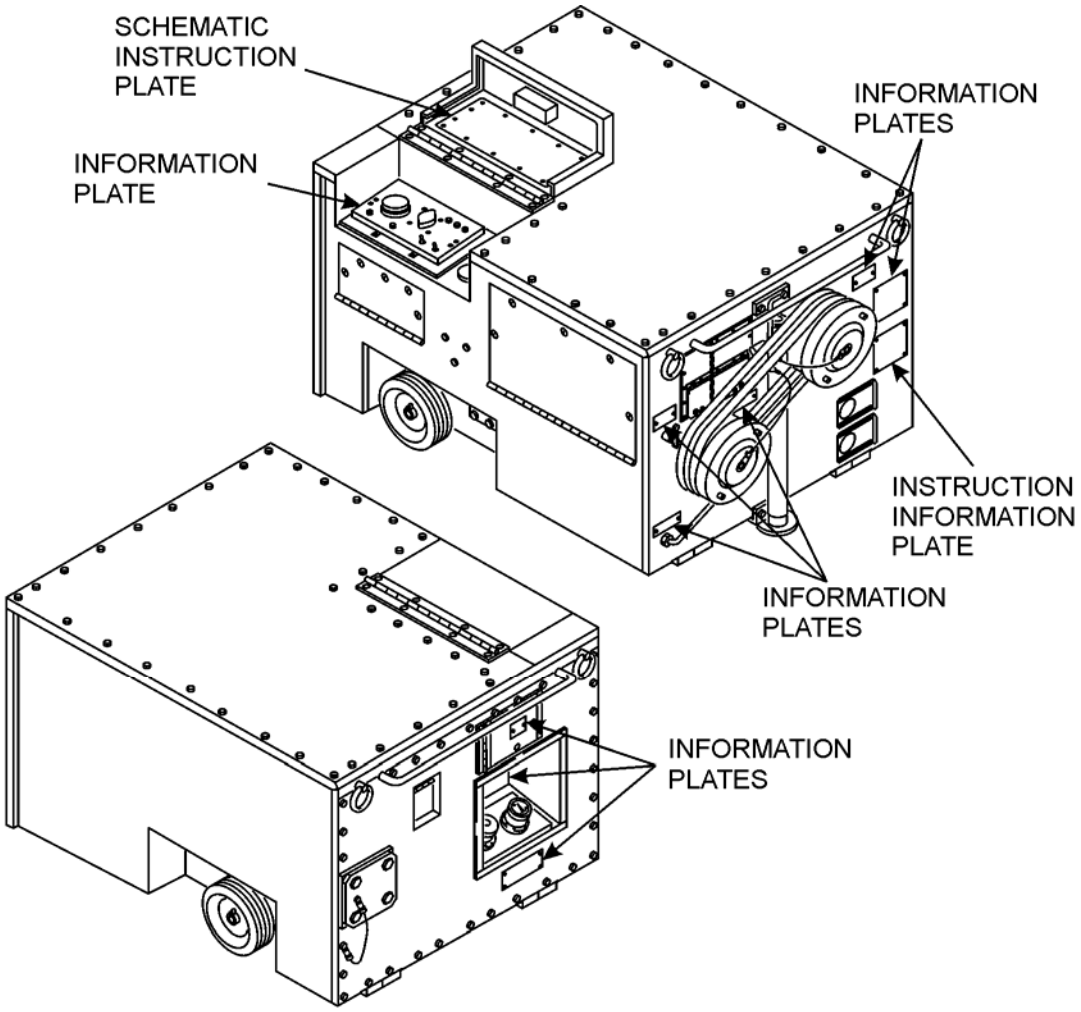
Table 1. Operator PMCS – Continued.

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
			EXTERNAL – Continued	
24	After	Exhaust Pipe and Elbow	1. Inspect for cracks or holes and loose or missing heat shield. 2. Inspect for loose or missing captive bolts. 	Cracks or holes. Loose or missing captive bolts.
25	Weekly	Carbon Monoxide Detectors	Press test/silence button to test carbon monoxide alarms. 	No alarms.

PMCS – Continued

Table 1. Operator PMCS – Continued.

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
EXTERNAL – Continued				
26	Monthly	Information, Instruction, and Schematic Instruction Plates	1. Inspect for loose, damaged, or missing plates. 2. Inspect plates for legibility.	Damaged or missing plates.



END OF WORK PACKAGE

CHAPTER 6

UNIT MAINTENANCE INSTRUCTIONS
FOR
ARMY SPACE HEATER H-140

UNIT MAINTENANCE INSTRUCTIONS

ARMY SPACE HEATER H-140

NSN 4520-01-477-0568

SERVICE UPON RECEIPT

INITIAL SETUP:

Test Equipment
None

Tools and Special Tools
Automotive general mechanic's tool kit (item 10, WP 0058 00)
Face shield (item 6, WP 0058 00)
Leather gloves (item 6, WP 0058 00)

Personnel Required
Two

References
DA PAM 738-750
FM 10-67-1
SF 361

Materials/Parts
3-prong plug (item 96, WP 0047 00)

Equipment Condition
None

SITE REQUIREMENTS

Location

1. Locate ASH approximately 7 feet (2.14m) from shelter, about midway between shelter supply and return air connections.
2. ASH supply and return air duct openings must be facing shelter connections.
3. Power source must be located within 25 feet (7.62m) of ASH.

CAUTION

Use only one external fuel hose (25 feet (7.62m)) when connecting to external fuel source or damage to ventilation air fan motor and fuel pump may result.

4. External fuel source must be located within 25 feet (7.62m) of ASH.

SITE REQUIREMENTS – Continued

Terrain

WARNING

FOR FUEL SPILLS, REFER TO FM 10-67-1, CONCEPTS AND EQUIPMENT OF PETROLEUM OPERATIONS.

Fuel is flammable and toxic to eyes, skin, and respiratory tract. Skin/eye protection is required. Avoid repeated/prolonged contact. Use only in well-ventilated areas. Keep away from open flames or other sources of ignition. Post FUEL FLAMMABLE/NO SMOKING signs around the area. Be sure a fire extinguisher is available.

Fuel on clothing can be fatal if ignited by a static discharge. If fuel gets on clothes, leave the refueling area as soon as possible, remove clothes, and wash skin with warm, soapy water before getting dressed.

Spilled fuel creates a flammable, vapor-air mixture and fire can take place. Improper positioning of external fuel source can cause fuel tank to overflow. Stop refueling immediately if fuel spill occurs.

1. Stow wheel assemblies as follows:

WARNING

Use care when using the jack assembly or when raising or lowering the wheel assemblies. Fingers or hands may be pinched causing injury to personnel.

CAUTION

Do not set up the ASH on extremely unleveled terrain (greater than 10 degrees (178 mils)) from true horizontal position). Improper operation or damage to equipment may result.

Do not overextend jack or damage to jack may result.

   a. Raise front of ASH by extending attached jack assembly (1).

   b. Remove wheel pin (2) and move wheels (3) up toward rear of ASH and install wheel pin.

   c. Lower front of ASH.

2. Level ASH by adjusting front with attached jack assembly (1) so that it does not exceed 10 degree (178 mils) incline.

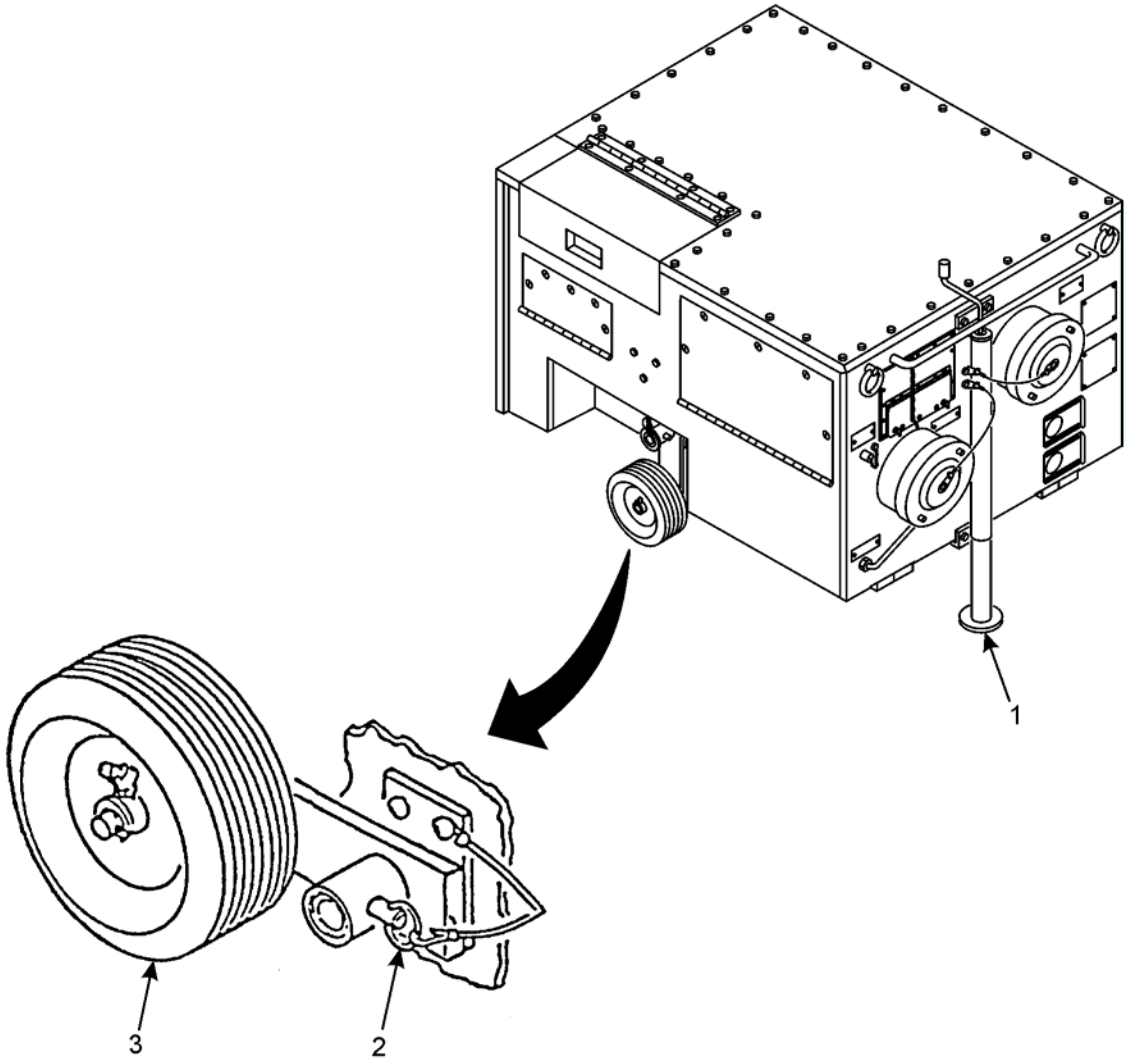
3. Area in front of ASH must be clear of objects that would interfere with proper positioning of supply and return air ducts or airflow to fresh air damper.

4. Area around and above exhaust pipe (6 feet (1.83m) from ground level) must be clear of obstacles.

5. Area on right side of ASH must allow access to operate controls on control panel.

6. Terrain for external fuel source should be as level as possible. External fuel source must be placed not lower than 12 inches (30.5 cm) below base of ASH and not higher than 10 feet (3m) above ASH.

SITE REQUIREMENTS – Continued



SERVICE UPON RECEIPT OF MATERIEL

Unpacking Instructions

Equipment may be crated in wooden crate or wrapped in plastic wrap.

Wooden Crate

1. Remove supply and return air hose assemblies shipping containers (1) from top of wooden crate (2).

WARNING

Wooden packing crate weighs 100 pounds (45.4 kg). Two people are required to lift.

2. Remove 18 lag bolts (3) and wooden crate (2). Save crate for reuse as required.

WARNING

Steel bands under tension can snap free and cause injury to personnel. Leather gloves and face shield are required.

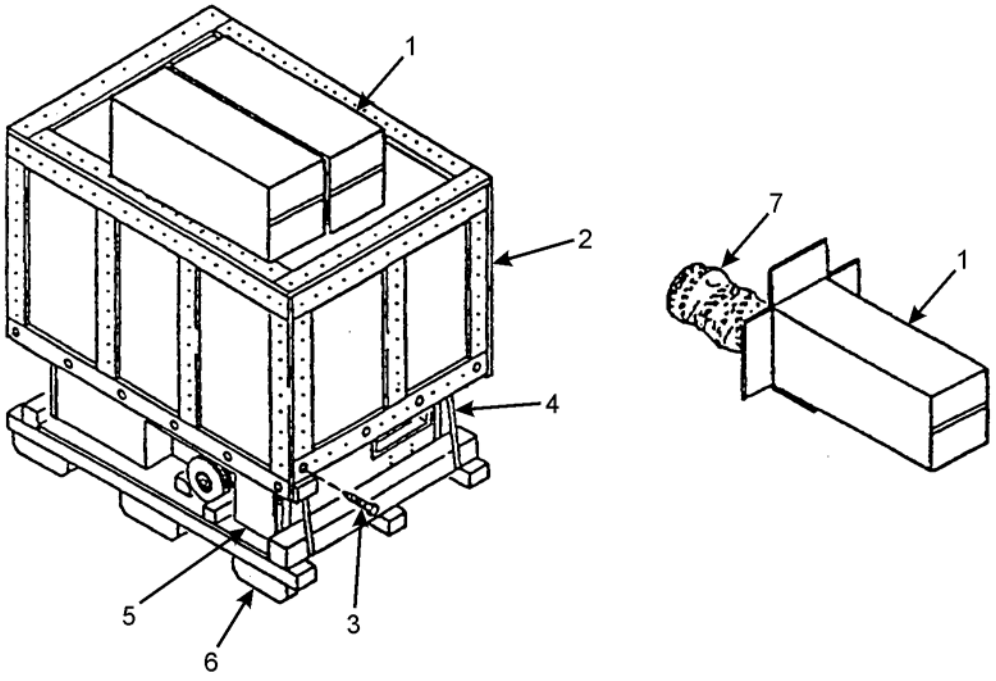
3. Cut steel bands (4) from ASH (5).

WARNING

ASH weighs 360 pounds (163.3 kg). Mechanical lift is required. For localized movement and positioning, lower wheels and manually move ASH to desired location by utilizing handrails.

4. Remove ASH (5) from skid (6). Save skid for reuse as required.

5. Carefully open supply and return air hose assemblies shipping containers (1) and remove air hose assemblies (7). Save containers for reuse as required.



SERVICE UPON RECEIPT OF MATERIEL – Continued

Plastic Wrap

1. Remove plastic wrap (1) and supply and return air hose assemblies shipping containers (2) from ASH (3).

WARNING

Steel bands under tension can snap free and cause injury to personnel. Leather gloves and face shield are required.

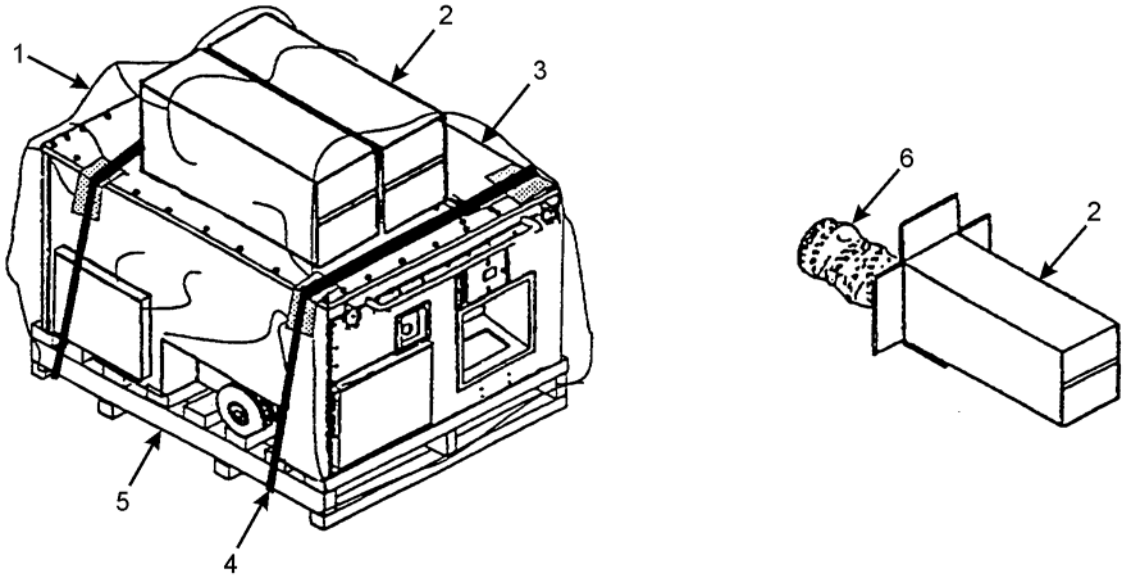
2. Cut steel bands (4) from ASH (3).

WARNING

ASH weighs 360 pounds (163.3 kg). Mechanical lift is required. For localized movement and positioning, lower wheels and manually move ASH to desired location by utilizing handrails.

3. Remove ASH (3) from skid (5). Save skid for reuse as required.

4. Carefully open supply and return air hose assemblies shipping containers (2) and remove air hose assemblies (6). Save containers for reuse as required.



Checking Unpacked Equipment

1. Inspect the equipment for damage incurred during shipment. If the equipment has been damaged, report damage on SF 361, Transportation Discrepancy Report.

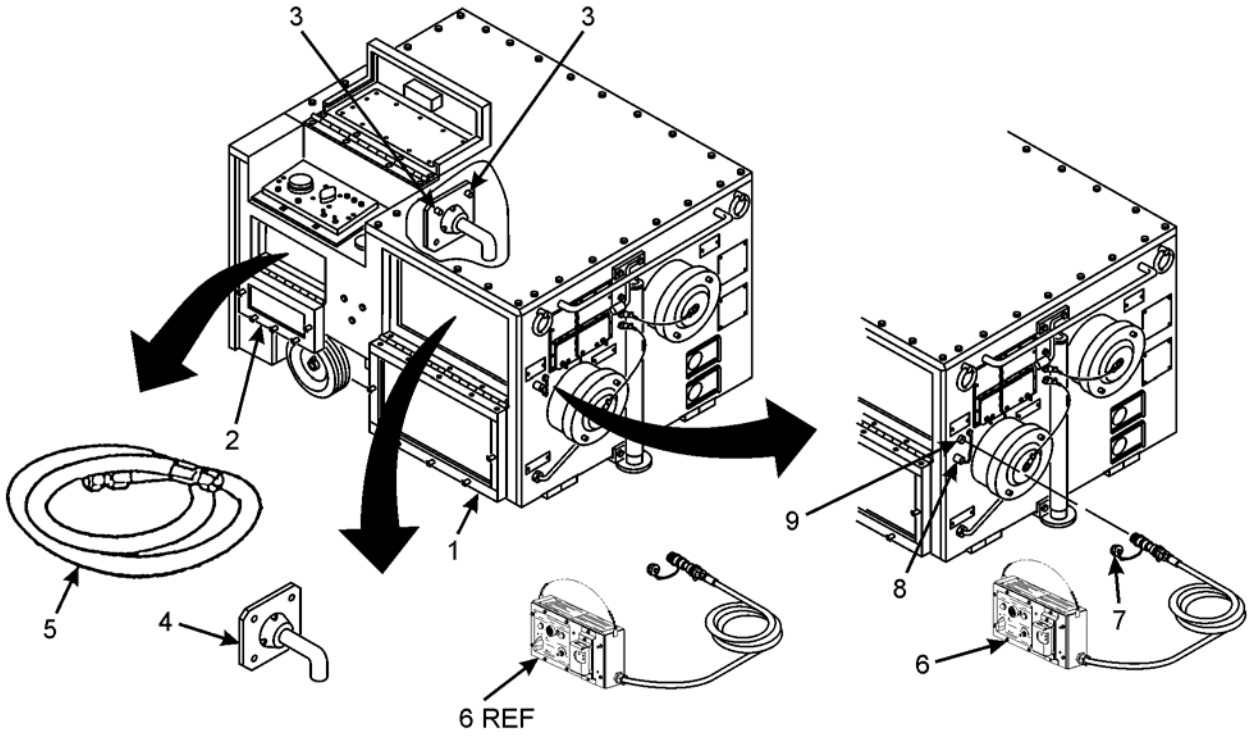
2. Check the equipment against packing slip to see if the shipment is complete. Report all discrepancies in accordance with applicable service instructions (e.g., DA PAM 738-750).

3. Check to see whether the equipment has been modified.

INSTALLATION INSTRUCTIONS

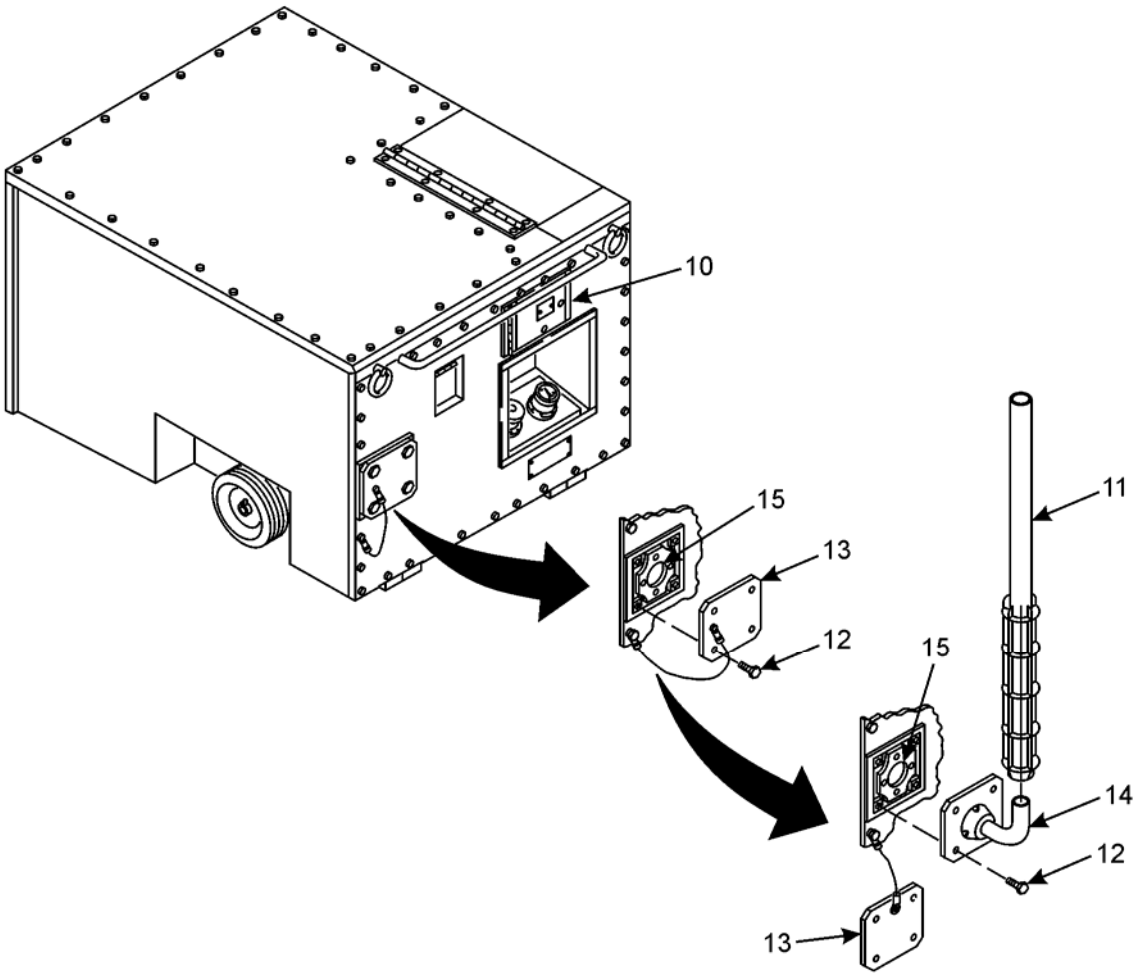
Assembly of Equipment

1. Open right side front door (1) and right side rear door (2).
2. Loosen two thumb screws (3) and remove exhaust elbow (4) and external fuel hose (5). Close right side front door (1).
3. Remove remote control box (6), Close right side rear door (2).
4. Remove dust cap (7) from remote control box (6) connector.
5. Remove remote control box connector cap (8) and connect remote control box (6) to connector (9).



INSTALLATION INSTRUCTIONS – Continued

6. Open exhaust pipe storage door (10), remove exhaust pipe (11), and close exhaust pipe storage door.
7. Remove four screws (12) and exhaust cover plate (13).
8. Position exhaust elbow (14) over exhaust port (15) and install four screws (12).
9. Install exhaust pipe (11) on exhaust elbow (14).



INSTALLATION INSTRUCTIONS – Continued

Installation of Equipment

1. Unwrap power cable (1) and lay aside.

2. Loosen four screws (2) and remove supply duct cover assembly (3) and return duct cover assembly (4).

NOTE

ASH may be operated either in a closed loop or a 100% fresh air configuration. Check with the operator for intended use prior to connecting the return air hose assembly to the ASH.

3. For recirculating air setup, refer to step 4. For 100% fresh air setup, refer to step 5. For external fuel connection, refer to step 6. For power cable adapter connection, refer to step 7.

4. For recirculating air setup, proceed as follows:

CAUTION

Supply and return air hose assemblies may have smooth bends when connected properly. Be careful to avoid sharp bends which will restrict airflow. Restrictions will cause improper operation or damage to equipment.

NOTE

Arrows on the supply and return air hose assemblies indicate the direction of the airflow.

   a. Connect supply air hose assembly (5) to ASH (6) and to shelter connection. Tighten two clamps (7) securely.

   b. Connect return air hose assembly (8) to ASH (6) and to shelter connection. Tighten two clamps (7) securely.

   c. Fresh air can be introduced into ASH by adjusting fresh air damper assembly (9). This can be accomplished at initial setup or by operator at a later time.

5. For 100% fresh air setup, proceed as follows:

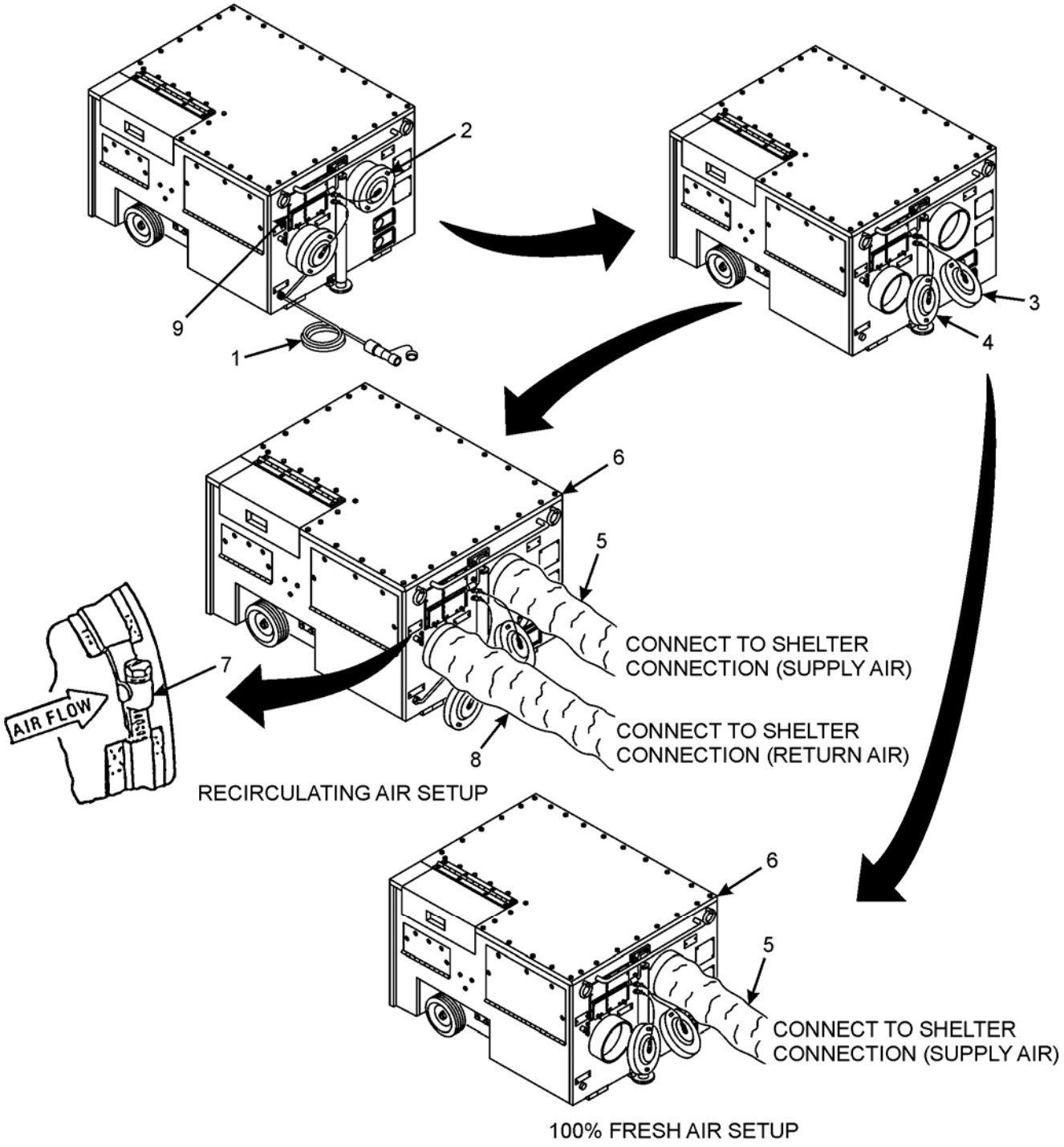
CAUTION

Supply and return air hose assemblies may have smooth bends when connected properly. Be careful to avoid sharp bends which will restrict airflow. Restrictions will cause improper operation or damage to equipment.

   a. Connect supply air hose assembly (5) to ASH (6) and to shelter connection. Tighten two clamps (7) securely.

   b. Do not connect return air hose assembly (8) to ASH (6).

INSTALLATION INSTRUCTIONS – Continued



INSTALLATION INSTRUCTIONS – Continued

6. For external fuel connection, proceed as follows:

WARNING

FOR FUEL SPILLS, REFER TO FM 10-67-1, CONCEPTS AND EQUIPMENT OF PETROLEUM OPERATIONS.

Fuel is flammable and toxic to eyes, skin, and respiratory tract. Skin/eye protection is required. Avoid repeated/prolonged contact. Use only in well-ventilated areas. Keep away from open flames or other sources of ignition. Post FUEL FLAMMABLE/NO SMOKING signs around the area. Be sure a fire extinguisher is available.

Fuel on clothing can be fatal if ignited by a static discharge. If fuel gets on clothes, leave the refueling area as soon as possible, remove clothes, and wash skin with warm, soapy water before getting dressed.

Spilled fuel creates a flammable, vapor-air mixture and fire can take place. Improper positioning of external fuel source can cause fuel tank to overflow. Stop refueling immediately if fuel spill occurs.

a. Remove dust cap (1) from external fuel port (2).

b. Remove dust cap (3) from external fuel hose (4) quick-disconnect and attach hose to ASH external fuel port (2).

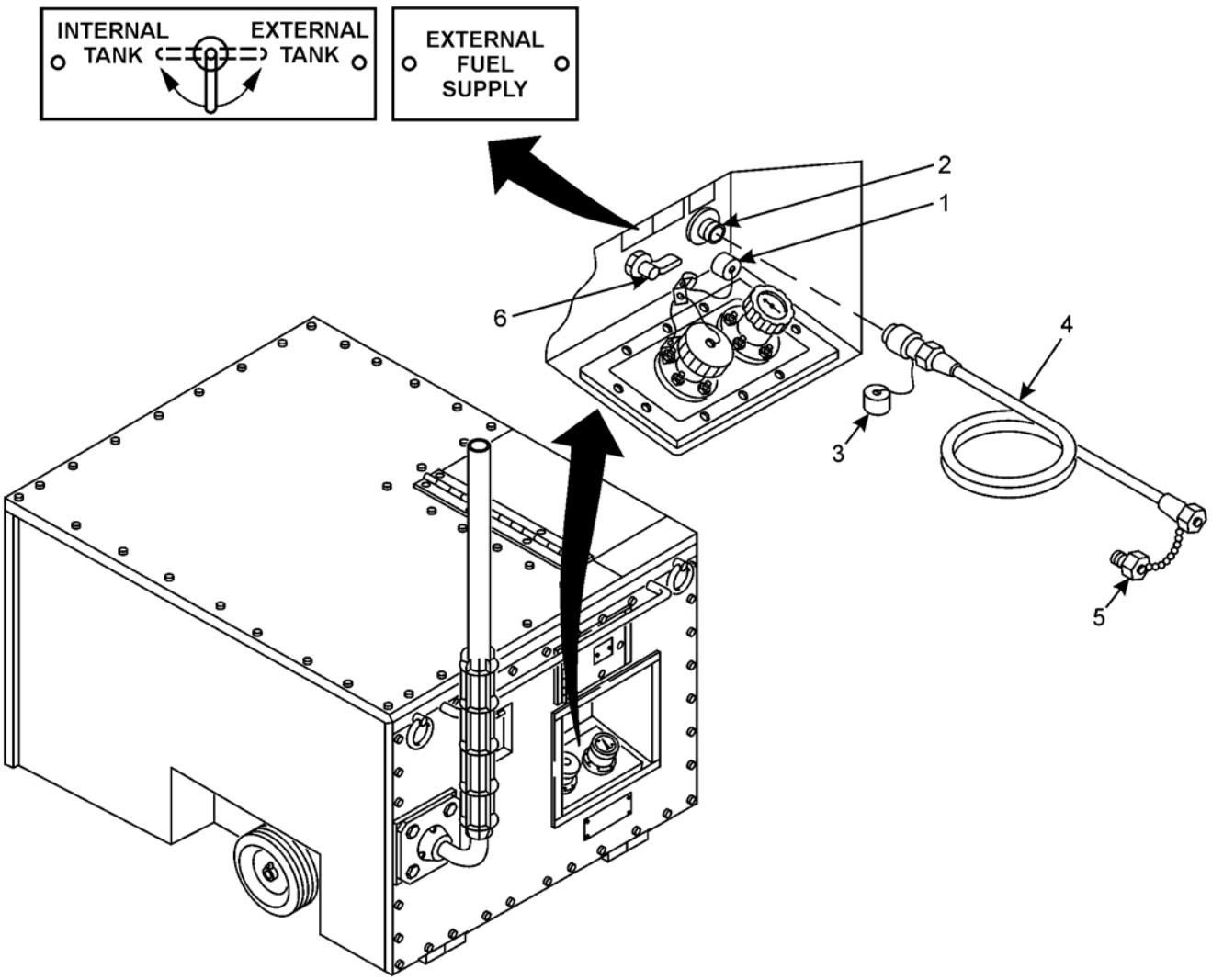
c. Remove plug (5) from external fuel hose (4) and connect hose to external fuel source.

CAUTION

The INTERNAL TANK/EXTERNAL TANK selector valve must be fully positioned to either setting. Any selector valve setting between INTERNAL TANK and EXTERNAL TANK may result in fuel starvation and damage to the fuel pump.

d. Set fuel selector valve (6) to EXTERNAL TANK position. Ensure that handle on fuel selector valve (6) is horizontal and pointing to the right.

INSTALLATION INSTRUCTIONS – Continued



7. For power cable adapter (1) connection, proceed as follows:

   a. Loosen three screws (2) on power source distribution panel (3).

NOTE

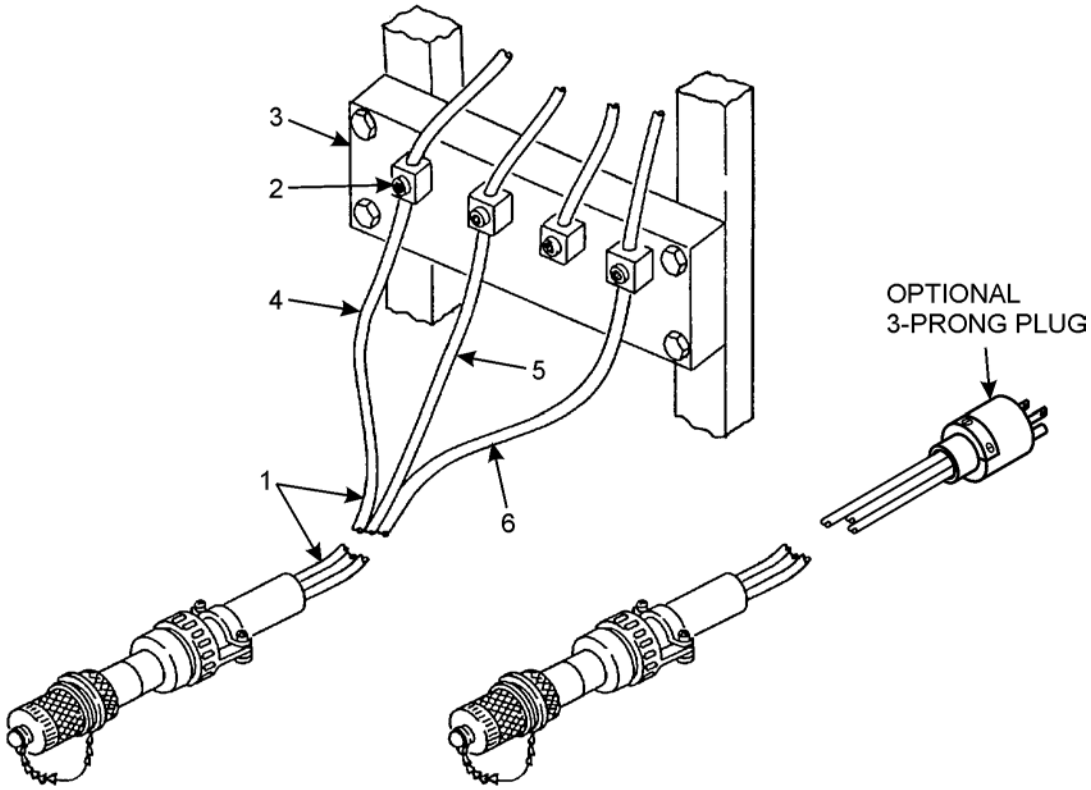
Power cable adapter is designed to attach to a 120 volt, 50/60 hertz, single-phase, grounded screw lug-type power source or facility power.

   b. Connect black wire (4) to power source hot connection and tighten screw (2).

   c. Connect white wire (5) to power source return connection and tighten screw (2).

   d. Connect green wire (6) to power source ground connection and tighten screw (2).

   e. When power cable adapter (1) has optional 3-prong plug installed, power cable adapter may be connected to facility power.



END OF WORK PACKAGE

UNIT MAINTENANCE INSTRUCTIONS

ARMY SPACE HEATER H-140

NSN 4520-01-477-0568

PMCS INTRODUCTION

INTRODUCTION

PMCS and lubrication are performed to keep the ASH in operating condition. Inspect the ASH within specified intervals so defects are found and corrected or problems are reported before any serious damage or failure occurs. Do the PMCS and lubrication per the PMCS, Including Lubrication Instructions work package (WP 0017 00). Pay attention to WARNING and CAUTION statements. A WARNING means someone could be hurt. A CAUTION means equipment could be damaged.

NOTE

Designated intervals are performed under usual operating conditions. PMCS intervals must be performed more frequently when operating under unusual conditions.

1. Be sure to perform your PMCS each time you operate the equipment. Always do your PMCS in the same order so that it gets to be a habit. Once you have had some practice, you will quickly spot anything wrong.

2. If you find something wrong when performing the PMCS, fix it if you can using the Unit Troubleshooting Procedures work package (WP 0012 00).

3. If anything looks wrong and you cannot repair it, write it on your DA Form 5988-E.

EXPLANATION OF COLUMNS IN THE PMCS

1. The ITEM column is a numeric listing of the order in which you are to do the check or service.

2. The INTERVAL column tells you when to do a certain check or service.

3. The ITEM TO BE CHECKED OR SERVICED column tells you what equipment to check or service.

4. The PROCEDURE column tells you how to do the required check or service. Carefully follow these instructions.

NOTE

The terms ready/available and mission capable refer to the same status: Equipment is on hand and ready to perform its combat missions. Refer to DA PAM 738-750.

5. The EQUIPMENT IS NOT READY/AVAILABLE IF: column tells you when your equipment is not mission capable and why the equipment cannot be used.

PMCS PROCEDURES – Continued

INSPECTION

Look for signs of a problem or trouble. Listen for unusual noise, clinking, rubbing, or squealing and watch and feel for unusual shaking or vibration. Be alert when in or around the ASH.

Inspect the ASH to see if items are in good condition. Are they correctly assembled, stowed, and secured; excessively worn, leaking, or corroded; or properly lubricated? Correct any problems found or notify direct support maintenance.

The following are checks that are common to all equipment:

WARNING

Cleaning compound solvent vapors are toxic. Avoid prolonged or repeated breathing of vapors or solvent contact with skin. Use only with adequate ventilation. Solvent is flammable and should not be used near open flame. Be sure a fire extinguisher is available.

1. Keep It Clean. Dirt, grease, oil, and debris only get in the way and may cover up a serious problem. Clean as you work and as needed. Use cleaning compound solvent (item 3, WP 0061 00) on all metal surfaces. Use soap and water when you clean rubber or plastic material.

2. Rust and Corrosion. Check equipment for rust and corrosion. If you find any bare metal or that corrosion exists, clean and apply a thin coat of lubricating oil (item 12, WP 0061 00).

3. Bolts, Screws, and Nuts. Check for looseness and missing, bent, or broken condition. Look for chipped paint, bare metal, rust, or corrosion around bolt and screw heads and nuts. Tighten any bolt, screw, or nut you think is loose (WP 0048 00).

4. Welds. Look for loose or chipped paint, rust, corrosion, or gaps where parts are welded together. If you find a bad weld, notify direct support maintenance on DA Form 5988-E.

5. Electrical Wires and Connectors. Look for cracked, frayed, or broken insulation; bare wires; and loose or broken connectors.

6. Hoses and Fluid Lines. Look for wear, damage, and leaks. Ensure that clamps and fittings are tight.

7. Hinges. Check hinges for security and smooth operation.

8. Data Plates. Check data plates, caution, and warning plates for security and legibility.

CLEANING

WARNING

DO NOT use diesel fuel, gasoline, or benzene (benzol) for cleaning.

DO NOT SMOKE when using cleaning solvents. NEVER USE CLEANING SOLVENTS NEAR AN OPEN FLAME. Be sure a fire extinguisher is available. Use cleaning solvents only in well-ventilated areas. The flash point of cleaning solvent is 138°F (60°C).

USE CARE when using cleaning solvents. Cleaning solvents evaporate quickly and can irritate exposed skin if solvents contact skin. In cold weather, contact of exposed skin with cleaning solvents can cause frostbite.

Cleaning compound solvent vapors are toxic. Avoid prolonged or repeated breathing of vapors or solvent contact with skin. Use only with adequate ventilation. Solvent is flammable and should not be used near open flame. Be sure a fire extinguisher is available.

Clean grease, rust, or fuel buildup or rusty places. Use cleaning compound solvent (item 3, WP 0061 00), then apply a thin coat of lubricating oil (item 12, WP 0061 00) to affected area, and use wiping rags (item 14, WP 0061 00).

LEAKAGE DEFINITIONS

It is necessary for you to know how fluid leakage affects the status of the ASH. Following are types/classes of leakage that you need to know to be able to determine the status of the ASH. Learn these leakage definitions and remember when in doubt, notify your supervisor.

CAUTION

Equipment operation is allowed with minor leakages (Class I or II). Consideration must be given to fluid capacity in the item/system being checked/inspected. When in doubt, notify your supervisor.

When operating with Class I or II leaks, continue to check fluid levels as required in the PMCS.

Class III leaks should be reported immediately to your supervisor.

CLASS I – Seepage of fluid (as indicated by wetness or discoloration) not great enough to form drops.

CLASS II – Leakage of fluid great enough to form drops but not enough to cause drops to drip from item being checked/inspected.

CLASS III – Leakage of fluid great enough to form drops that fall from item being checked/inspected.

END OF WORK PACKAGE

UNIT MAINTENANCE INSTRUCTIONS

ARMY SPACE HEATER H-140

NSN 4520-01-477-0568

PMCS, INCLUDING LUBRICATION INSTRUCTIONS

INITIAL SETUP:

Test Equipment
None

Tools and Special Tools
None

Personnel Required
One

References
WP 0026 00
WP 0028 00
WP 0029 00
WP 0030 00
WP 0031 00

References – Continued
WP 0033 00
WP 0035 00
WP 0036 00
FM 4-25.11
FM 10-67-1

Materials/Parts
Anti-seize compound (item 2, WP 0061 00)
Automotive and artillery grease (item 10, WP 0061 00)
Wiping rag (item 14, WP 0061 00)

Equipment Conditions
None

WARNING

Contact with hot components can cause burns. Allow ASH to cool down before attempting service, inspection, or maintenance activity.

FOR FUEL SPILLS, REFER TO FM 10-67-1, CONCEPTS AND EQUIPMENT OF PETROLEUM OPERATIONS.

Fuel is flammable and toxic to eyes, skin, and respiratory tract. Skin/eye protection is required. Avoid repeated/prolonged contact. Use only in well-ventilated areas. Keep away from open flames or other sources of ignition. Post FUEL FLAMMABLE/NO SMOKING signs around the area. Be sure a fire extinguisher is available.

Fuel on clothing can be fatal if ignited by a static discharge. If fuel gets on clothes, leave the refueling area as soon as possible, remove clothes, and wash skin with warm, soapy water before getting dressed.

Spilled fuel creates a flammable, vapor-air mixture and fire can take place. Improper positioning of external fuel source can cause fuel tank to overflow. Stop refueling immediately if fuel spill occurs.

INITIAL SETUP – Continued:

WARNING

FOR ARTIFICIAL RESPIRATION, REFER TO FM 4-25.11, FIRST AID.

Electrical high voltage cannot be seen but can kill you. Electricity is unlike most other dangerous things you can come in contact with because it gives no warning and no symptoms to be wary of. Its effect is immediate. It can kill you, render you unconscious, or severely burn you.

To ensure your safety and that of other maintenance personnel, always observe the following precautions:

DO NOT perform any maintenance on electrical equipment unless all power is removed.

BE CERTAIN that there is someone assisting you who can remove power immediately.

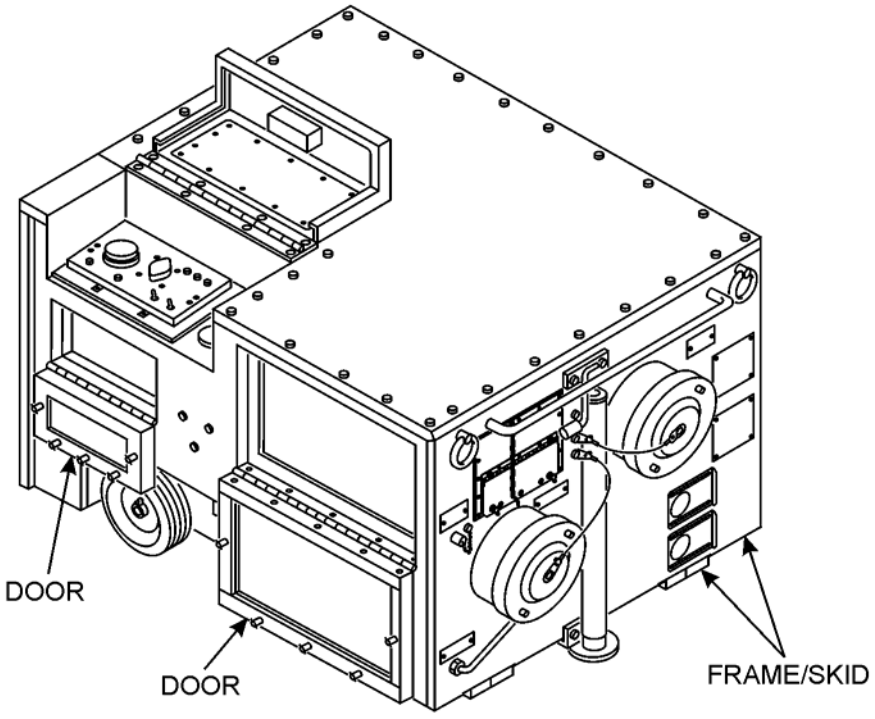
PMCS

Table 1 provides unit PMCS for the ASH. Table 2 provides lubrication instructions for the ASH.

PMCS – Continued

Table 1. Unit PMCS.

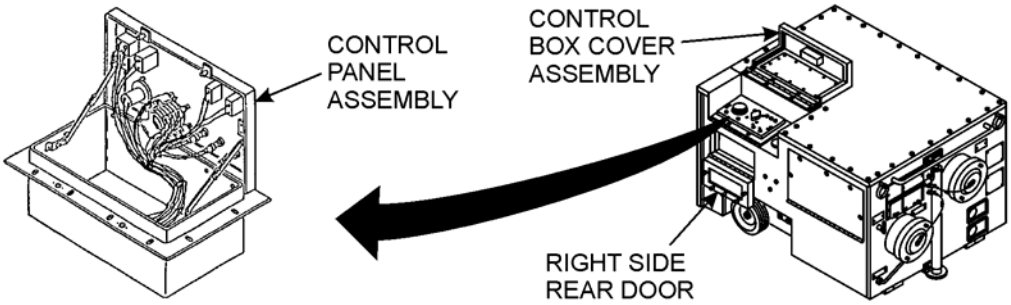
ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
			EXTERNAL/INTERNAL	
1	Semi-annually	Cabinet Assembly	1. Visually inspect all four sides and top and bottom of ASH, including frame, for cracks, loose or missing hardware, and corrosion.	Cracks in frame, loose or missing hardware.
			2. Open all access doors.	
			3. Inspect inside for loose or missing hardware, cracks, or other damage.	Loose or missing hardware or damage.
			4. Inspect inside bottom of ASH for accumulation of water or fuel.	Fuel in bottom of ASH.



PMCS – Continued

Table 1. Unit PMCS – Continued.

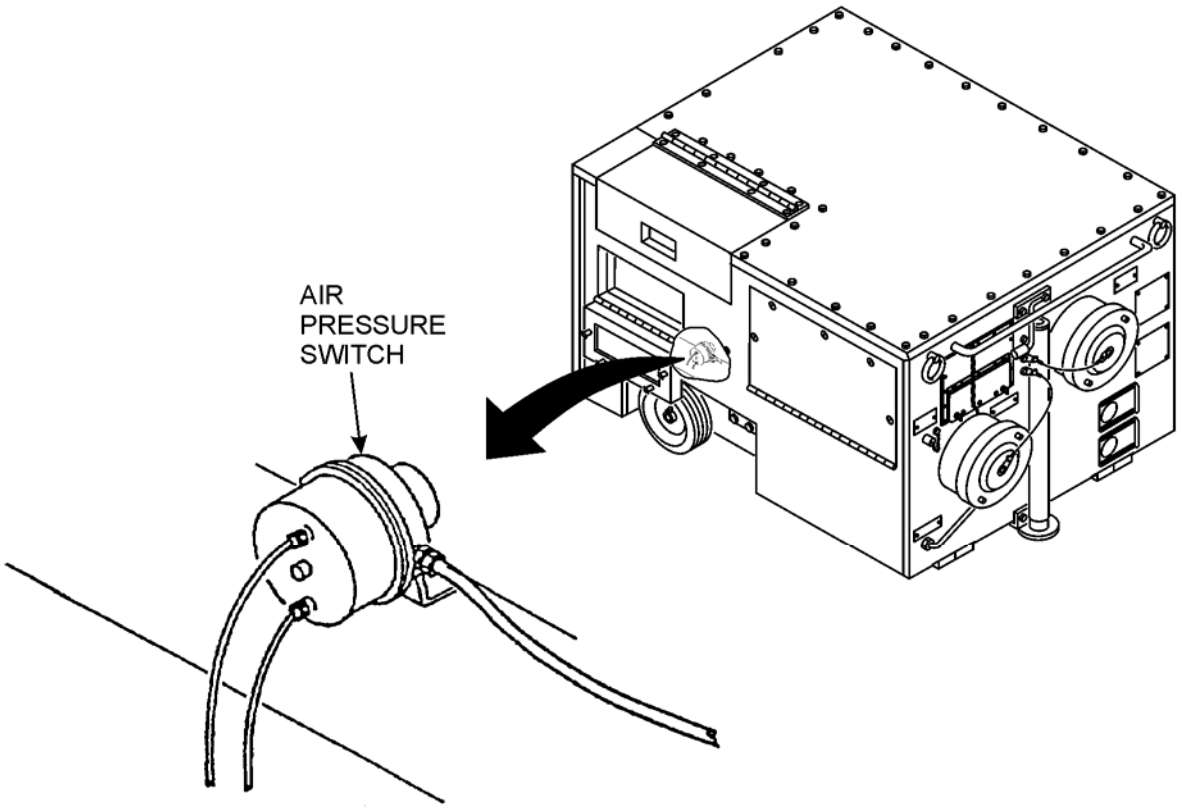
ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
			EXTERNAL/INTERNAL – Continued	
2	Semi-annually	Electrical Control Assembly	1. Open right side rear door. 2. Open control box cover assembly. 3. Open control panel assembly. 4. Inspect components for damaged or missing hardware or corrosion. 5. Inspect for loose connections, chafing, or exposed wires (WP 0026 00).	Loose or exposed wires.



PMCS – Continued

Table 1. Unit PMCS – Continued.

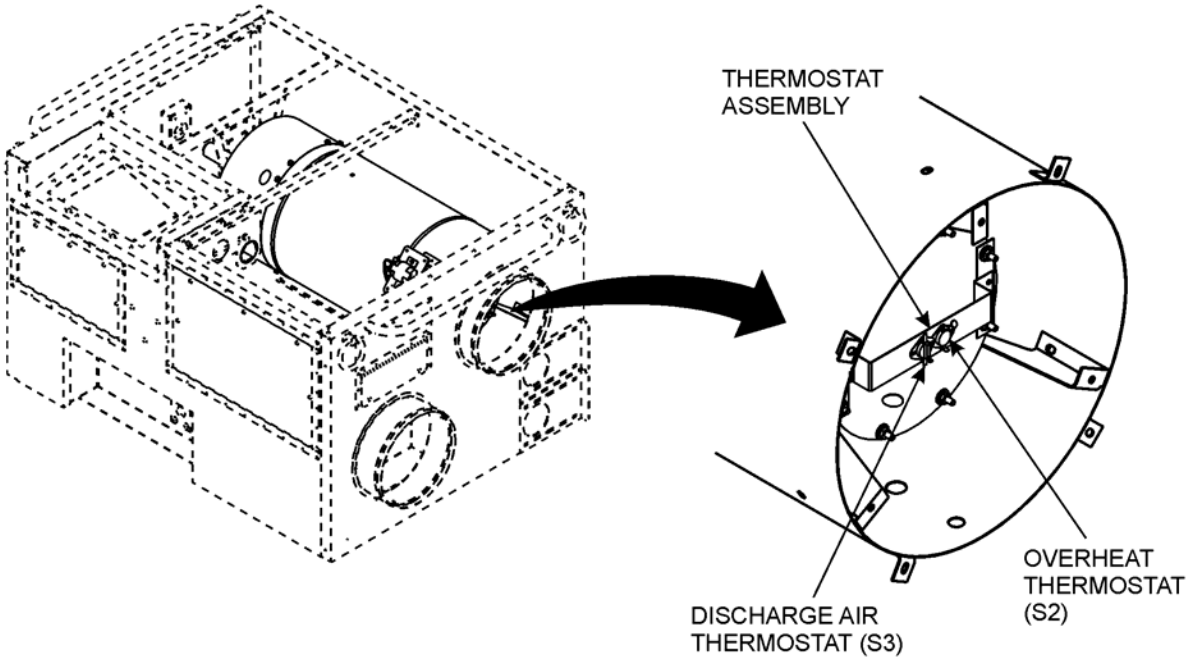
ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
			INTERNAL	
3	Semi-annually	Air Pressure Switch	1. Inspect for loose or missing hardware. 2. Inspect for loose connections, chafing, or exposed wires. 3. Inspect air line for security, kinks, or cracks (WP 0028 00).	Loose chafing, or broken wires.



PMCS – Continued

Table 1. Unit PMCS – Continued.

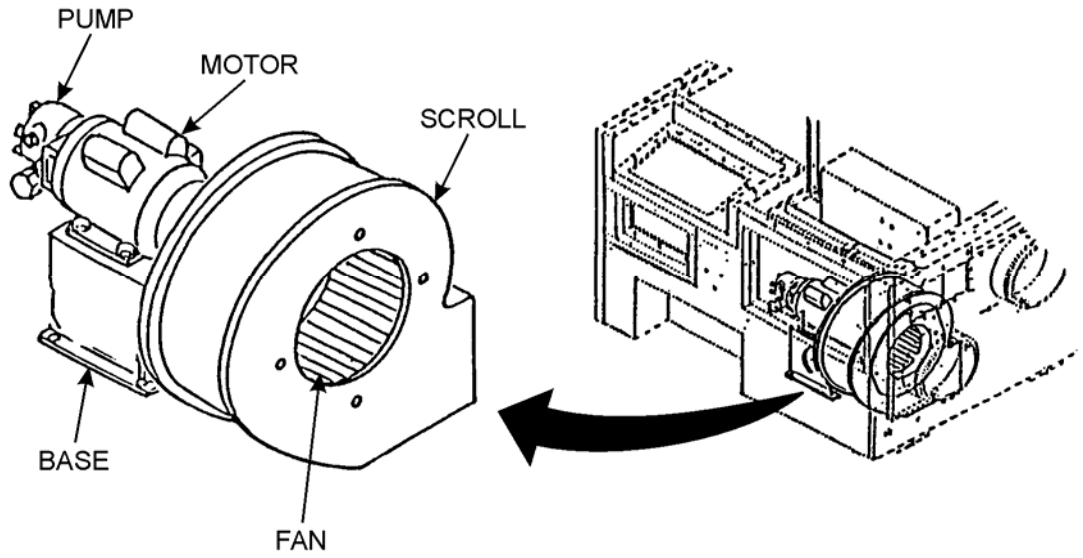
ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
		INTERNAL – Continued		
4	Semi-annually	Thermostat Assembly		
		1. Discharge Air Thermostat	1. Inspect for secure mounting and corrosion.	
			2. Inspect for loose connections, chafing, or exposed wires.	Loose, connections, chafing, or exposed wires.
		2. Overheat Thermostat	1. Inspect for secure mounting and corrosion.	
			2. Inspect for loose connections, chafing, or exposed wires.	Loose connections, chafing, or exposed wires.



PMCS – Continued

Table 1. Unit PMCS – Continued.

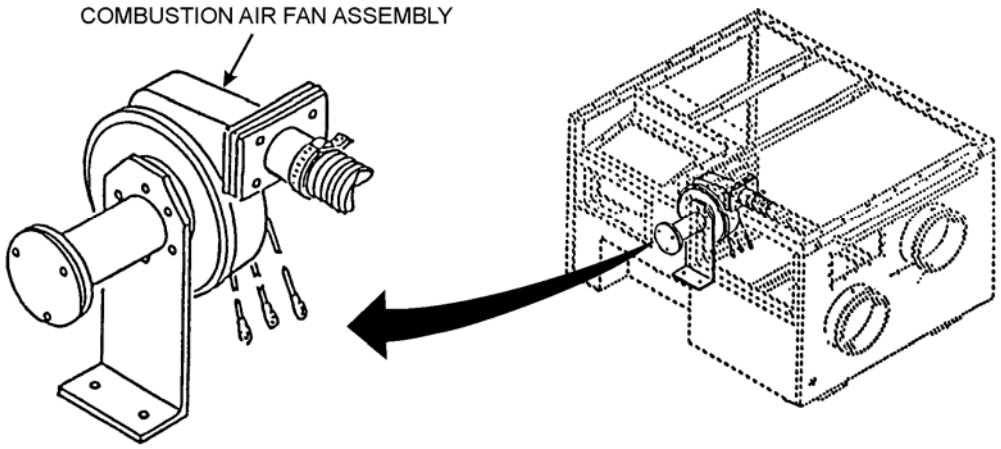
ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
			INTERNAL – Continued	
5	Semi-annually	Ventilation Air Fan and Motor Assembly		
		1. Fan	1. Inspect fan for damaged or missing blades or loose or missing hardware.	Loose, missing, or damaged blades or hardware.
			2. Inspect scroll for holes, dents, or loose or missing hardware.	Loose or damaged scroll.
		2. Fuel Pump	1. Inspect fuel pump for security and leaks (WP 0030 00).	Any leaks.
			2. Check coupling spring pin and cotter pin for security (WP 0030 00).	Missing spring pin or cotter pin.
		3. Motor	1. Inspect motor for loose or damaged hardware. Tighten or replace hardware.	Loose or damaged hardware.
			2. Inspect for loose connections, chafing, or exposed wires (WP 0033 00).	Loose, frayed, or exposed wires.
		4. Base	Inspect for loose or missing hardware.	Loose base.



PMCS – Continued

Table 1. Unit PMCS – Continued.

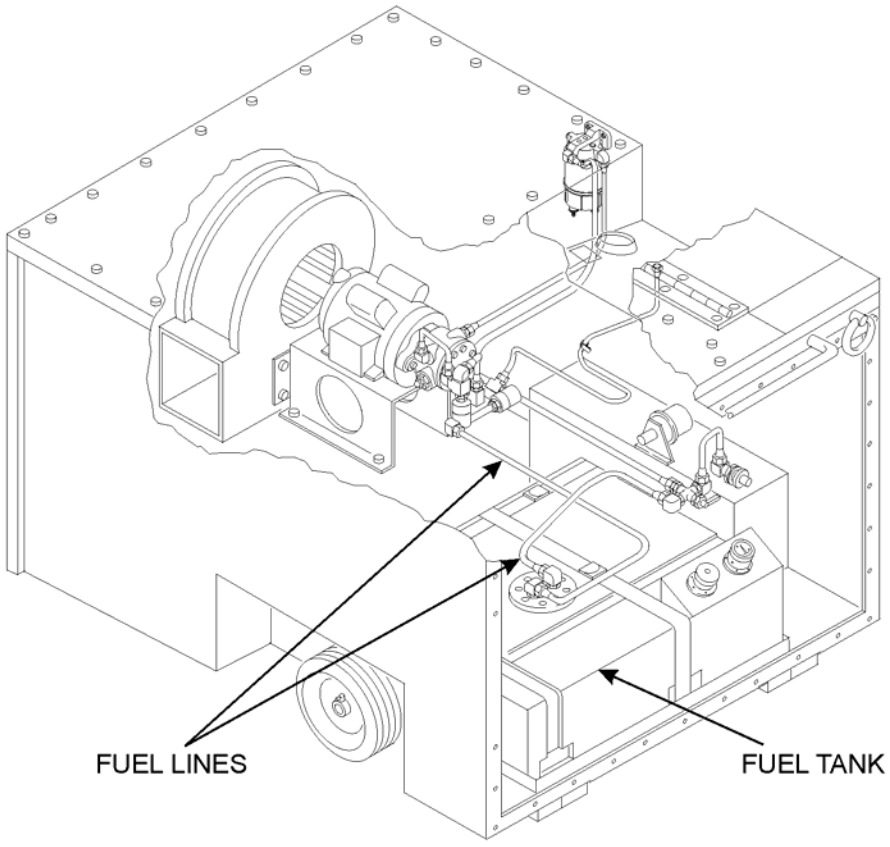
ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
			INTERNAL – Continued	
6	Semi-annually	Combustion Air Fan Assembly	1. Inspect fan assembly for damaged or missing blades, loose or missing hardware, or corrosion (WP 0033 00).	1. Damaged or missing blades. 2. Loose or damaged hardware.
			2. Inspect air hose for security, holes, cracks, or corrosion (WP 0033 00).	Holes or cracks in hose.
			3. Inspect motor base for loose or missing hardware, cracks, or corrosion (WP 0033 00).	Loose or missing hardware.
			4. Inspect for loose connections, chafing, or exposed wires (WP 0033 00).	Loose connections, chafing, or exposed wires.



PMCS – Continued

Table 1. Unit PMCS – Continued.

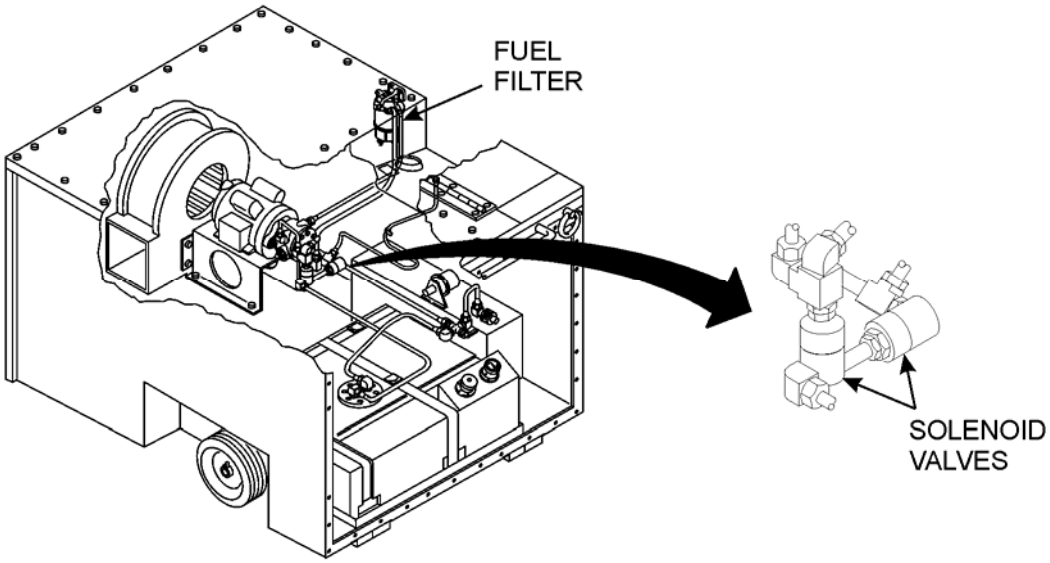
ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
		INTERNAL – Continued		
7	Semi-annually	Fuel Tank Assembly		
		1. Fuel Tank	Inspect for loose or missing hardware, leaks, corrosion, or other damage (WP 0029 00).	Any leaks.
		2. Fuel Lines	1. Inspect for chafing, cracks, leaks, corrosion, or other damage. 2. Remove damaged fuel lines and replace (WP 0029 00).	Any leaks.



PMCS – Continued

Table 1. Unit PMCS – Continued.

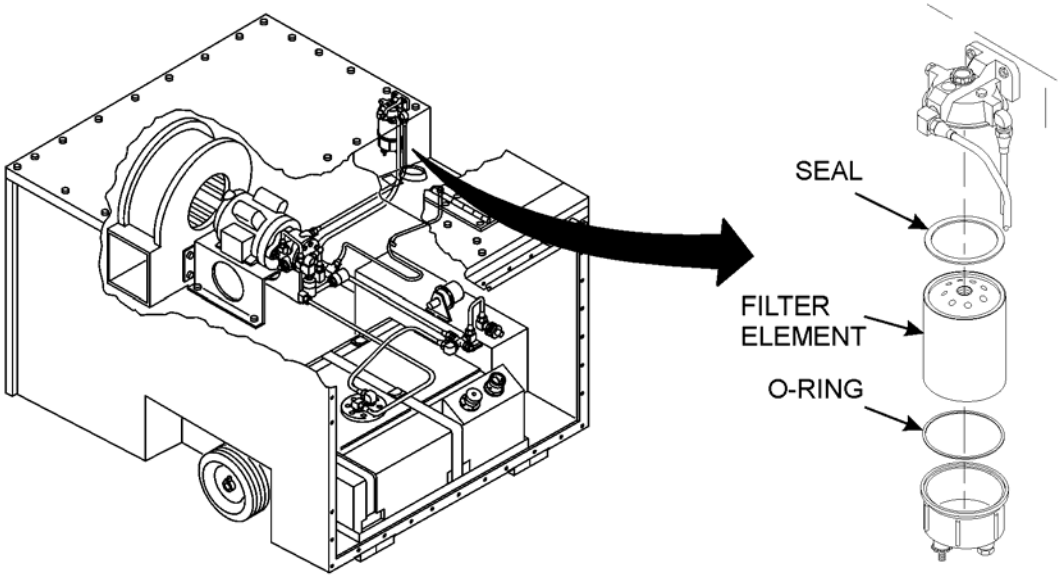
ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
			INTERNAL – Continued	
8	250 Hours	Fuel Filter and Solenoid Valves	Inspect for loose or missing hardware or loose or broken connections and leaks.	Any leaks.



PMCS – Continued

Table 1. Unit PMCS – Continued.

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
INTERNAL – Continued				
9	500 Hours	Fuel Filter Element	Replace O-ring, seal, and filter element (WP 0031 00).	Filter element not replaced.



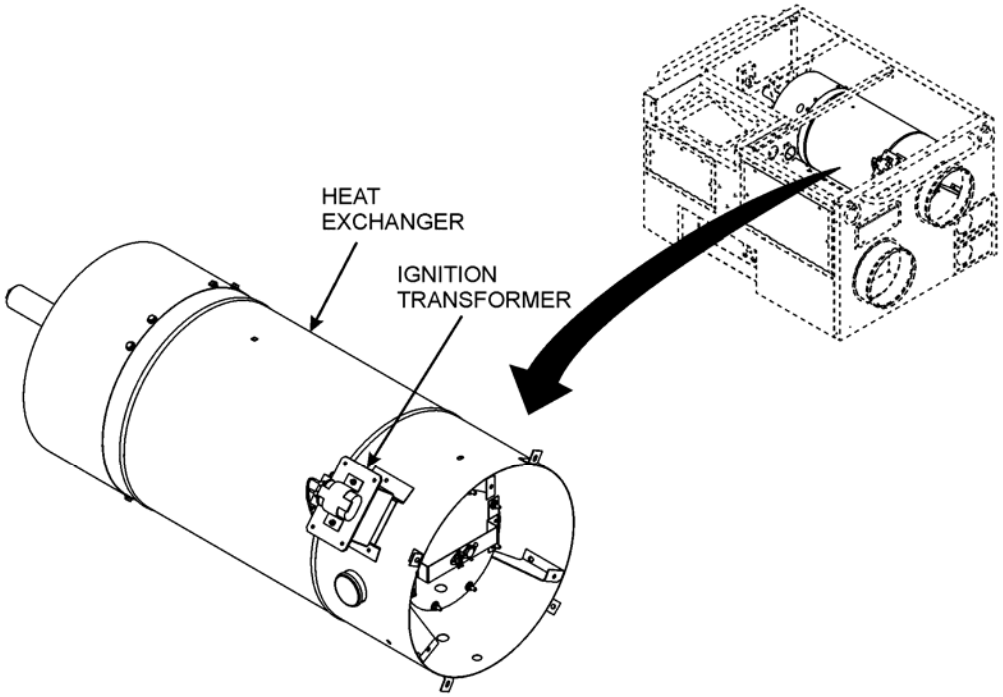
PMCS – Continued

Table 1. Unit PMCS – Continued.

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
			INTERNAL – Continued	
10	1,000 Hours	Heat Exchanger Assembly		
		1. Heat Exchanger	1. Inspect for loose or missing hardware.	Missing hardware.
			2. Inspect for holes, cracks, other signs of burn-through or corrosion.	Holes, cracks, or signs of burn-through.
			3. Inspect exhaust pipe for security, holes, cracks, other signs of exhaust leaks, or corrosion.	Any leaks.
			4. Remove sight glass. Clean lens with wiping rag (item 14, WP 0061 00). Apply anti-seize compound (item 2, WP 0061 00) to sight glass and install on heat exchanger assembly.	Dirty lens.
		2. Ignition Transformer	1. Inspect for loose or missing hardware. Tighten loose hardware. Replace missing hardware (WP 0035 00).	Loose or missing hardware.
			2. Inspect for loose connections, chafing, or exposed wires (WP 0035 00).	Loose connections, chafing, or exposed wires.

PMCS – Continued

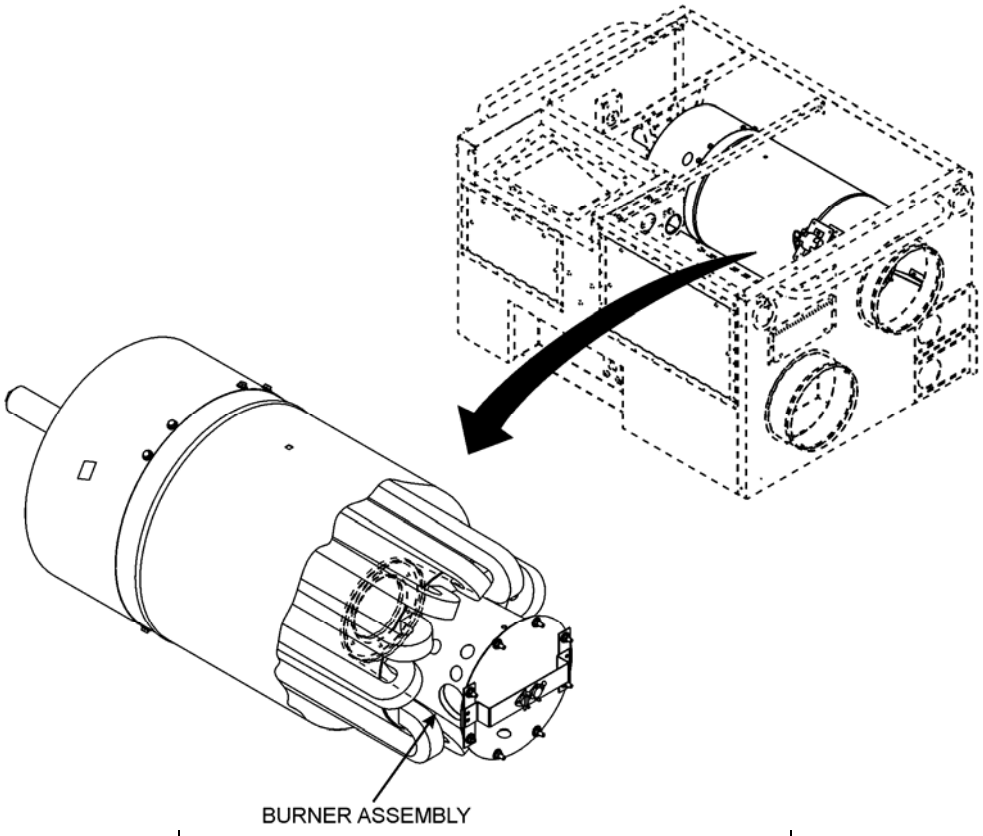
Table 1. Unit PMCS – Continued.

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
INTERNAL – Continued				
10 – Cont'd				

PMCS – Continued

Table 1. Unit PMCS – Continued.

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
INTERNAL – Continued				
10 – Cont'd		3. Burner Assembly	1. Inspect for loose or missing hardware on burner section. 2. Inspect for holes, cracks, other signs of burn-through, or corrosion on burner section. 3. Remove burner assembly from heat exchanger (WP 0036 00).	Missing hardware. Holes, cracks, or signs of burn-through.



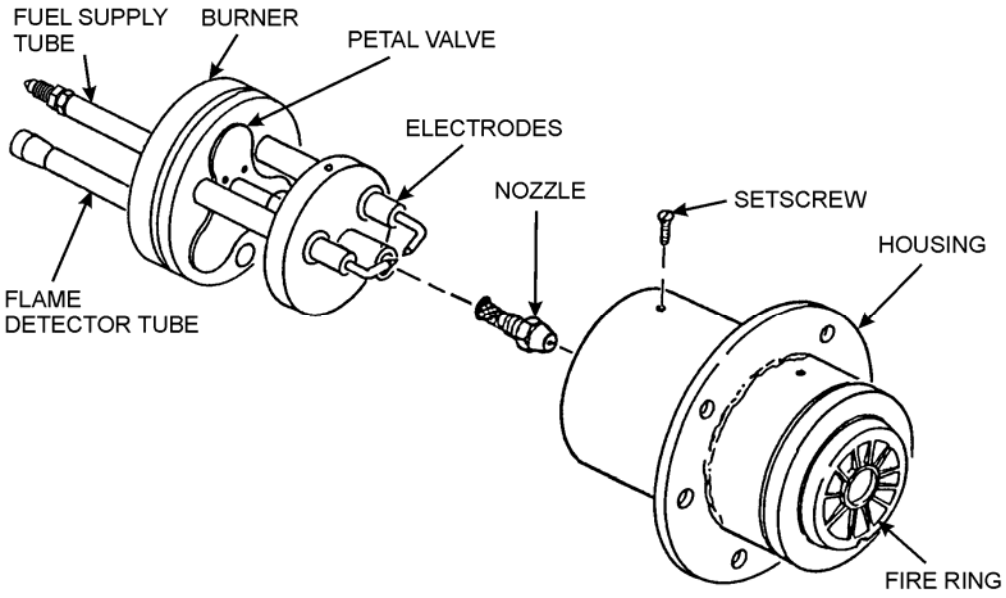
PMCS – Continued

Table 1. Unit PMCS – Continued.

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
		INTERNAL – Continued		
10 – Cont'd		4. Burner	Remove three setscrews and pull burner from housing.	
		a. Nozzle	1. Remove nozzle from burner and inspect filter.	Dirty filter.
			2. Install nozzle snugly on burner. Do not over-tighten.	
		b. Electrodes	1. Inspect for cleanliness and secure mounting.	
			2. Check for signs of pitting, burning, or cracking.	Cracks in electrodes.
		c. Fire Ring	1. Inspect for cleanliness and secure mounting.	
			2. Inspect for burning or other signs of damage.	
		d. Fuel Supply Tube	Inspect for evidence of leaks and secure mounting.	Any leaks.
		e. Flame Detector Tube	1. Inspect for secure mounting.	
			2. Inspect for cracks or bends.	Cracked or bent tube.
			CAUTION Petal valve is an extremely delicate mechanism. Do not touch petal valve.	
		f. Petal Valve	1. Visually inspect for cracks, tears, or bends.	Cracks, tears, or bends.
			2. Install burner into housing until burner is flush with back of housing. Install three setscrews.	

PMCS – Continued

Table 1. Unit PMCS – Continued.

ITEM NO.	INTERVAL	ITEM TO BE CHECKED OR SERVICED	PROCEDURE	EQUIPMENT NOT READY/ AVAILABLE IF:
INTERNAL – Continued				
10 – Cont'd				

LUBRICATION INSTRUCTIONS

These lubrication instructions are for unit (O) maintenance. Refer to Table 2 for lubricant of ASH wheels. Lubrication intervals (on-condition or hard time) are based on normal operation. Lubricate more frequently during constant use and less during inactive periods. The man-hour specified is the time you need to do all the services prescribed for a particular interval. Use the correct grade of lubricant for the seasonal temperature expected.

Lubrication interval and symbol: A = Annually or as required.

Before you start your lubrication:

ALWAYS

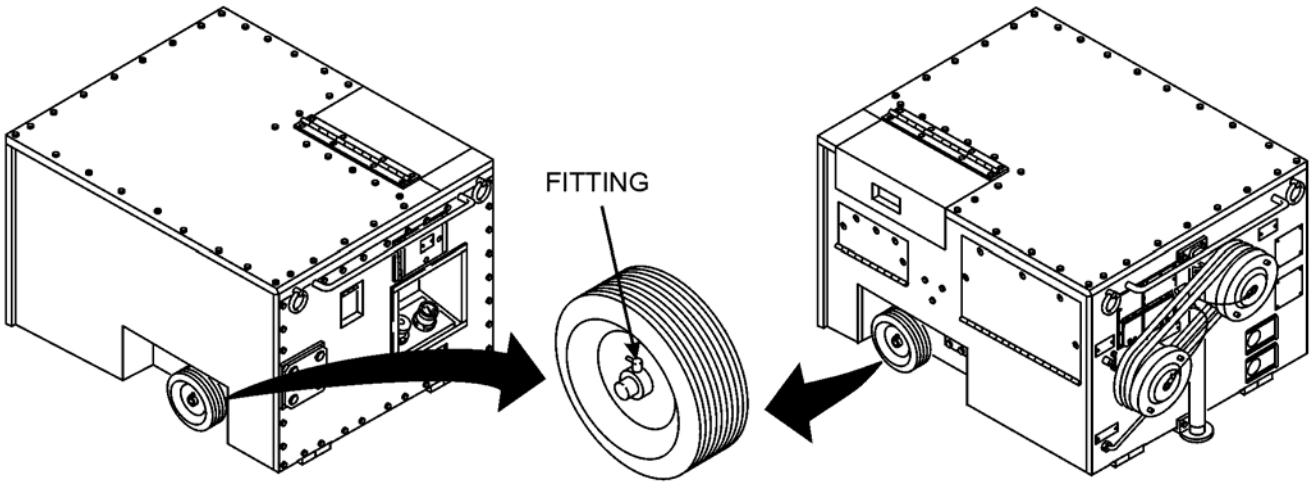
1. Clean grease fitting before lubrication.
2. After lubrication, wipe off excessive grease from fittings to prevent buildup of dirt grit, and contaminants.

NEVER

1. Use wrong type/grade grease.
2. Use too much lubricant.

Table 2. Lubricant for Wheels.

NOMENCLATURE: TEMPERATURE RANGE	LUBRICANT	CAPACITY	INTERVAL	MAN-HOUR
Grease Fittings: –60°F to 100°F (–51°C to 38°C)	GAA (item 10, WP 0061 00)	As required.	A	0.5



END OF WORK PACKAGE

UNIT MAINTENANCE INSTRUCTIONS

ARMY SPACE HEATER H-140

NSN 4520-01-477-0568

EXHAUST PIPE AND ELBOW REMOVAL, CLEANING, INSPECTION, INSTALLATION

INITIAL SETUP:

Test Equipment
None

Tools and Special Tools
Automotive general mechanic's tool kit (item 10, WP 0058 00)
Medium bristle brush (item 6, WP 0058 00)

Personnel Required
One

References
None

Materials/Parts
None

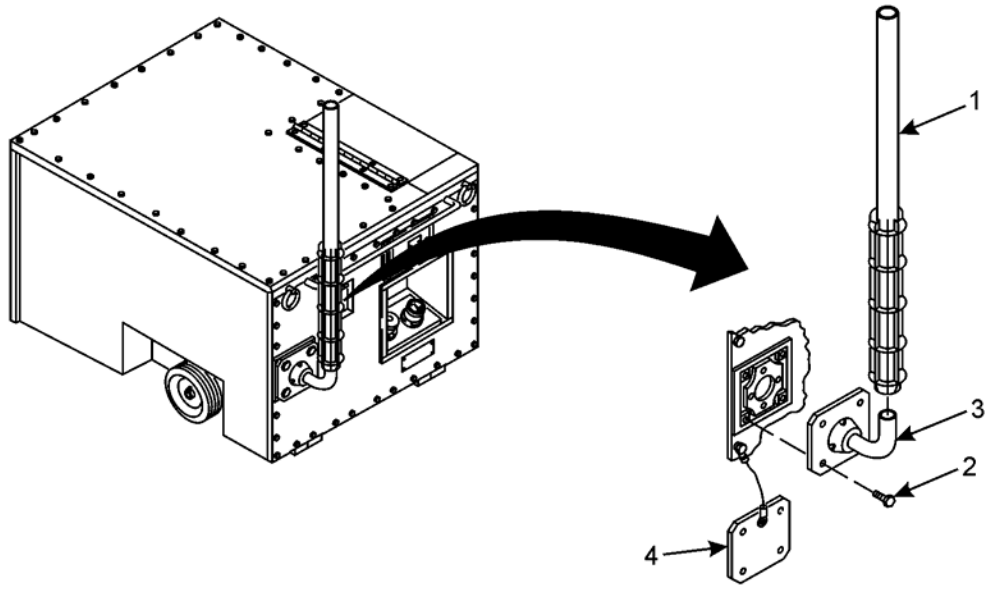
Equipment Condition
ASH disconnected from power source (WP 0005 00)

WARNING

Contact with hot components can cause burns. Allow ASH to cool down before attempting service, inspection, or maintenance activity.

REMOVAL

1. Remove exhaust pipe (1).
2. Remove four screws (2) and elbow (3).
3. Install cover plate (4) and four screws (2).



CLEANING

Clean exhaust pipe (1) section interiors and exteriors with a medium bristle brush to remove dirt and soot.

INSPECTION

1. Inspect screws (2) for stripped or damaged threads.
2. Inspect elbow (3) for cracked welds and cracked or damaged mounting plate.
1. Inspect exhaust pipe (1) for dents, holes, cracks, broken welds, corrosion, and secure mounting.
2. Inspect cover plate (4) and lanyard for corrosion, damage, and secure connections.

INSTALLATION

1. Remove four screws (2) and cover plate (4).
2. Install elbow (3) and four screws (2).
3. Install exhaust pipe (1) onto elbow (3).

END OF WORK PACKAGE

UNIT MAINTENANCE INSTRUCTIONS

ARMY SPACE HEATER H-140

NSN 4520-01-477-0568

SUPPLY AND RETURN AIR HOSE ASSEMBLIES REMOVAL, CLEANING, INSPECTION, REPAIR, INSTALLATION

INITIAL SETUP:

Tools and Special Tools
Automotive general mechanic's tool kit (item 10, WP 0058 00)

Personnel Required
One

References
None

Materials/Parts
General purpose detergent (item 4, WP 0061 00)
Pressure sensitive tape (item 26, WP 0061 00)
Wiping rag (item 14, WP 0061 00)

Equipment Condition
ASH disconnected from power source (WP 0005 00)

WARNING

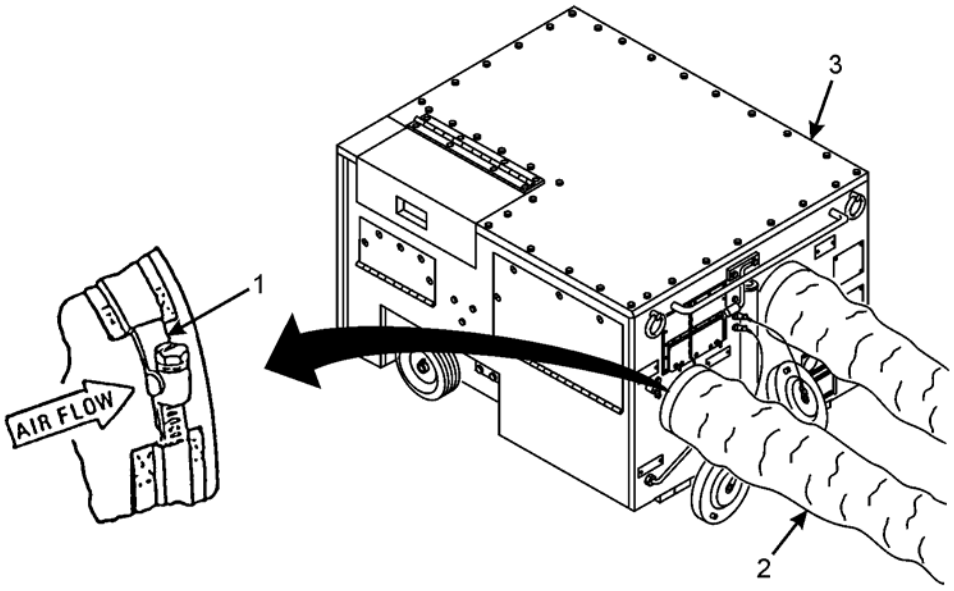
Contact with hot components can cause burns. Allow ASH to cool down before attempting service, inspection, or maintenance activity.

NOTE

Procedures are typical for the supply and return air hose assemblies.

REMOVAL

Loosen clamp (1) on each end of air hose assembly (2) and remove from ASH (3) and shelter connector.



CLEANING

1. Clean air hose assembly (2) with a mild solution of general purpose detergent and water.
2. Rinse thoroughly with clean water.
3. Allow to dry completely.

INSPECTION

1. Inspect clamps (1) for damaged screw head, deformed slots on strap, corrosion, and broken strap.
2. Inspect air hose assembly (2) for rips, tears, and deterioration.
3. Inspect air hose assembly (2) stiffener for bends and breaks.

REPAIR

1. Patch small tears and holes with pressure sensitive tape.
2. Replace air hose assembly (2) if clamps (1) are damaged or large tears or holes are present in fabric.

INSTALLATION

1. Install air hose assembly (2) on ASH (3) with arrow facing direction of airflow.
2. Install other end of air hose assembly (2) to shelter connector.
3. Tighten clamp (1) on each end of air hose assembly (2) securely.

END OF WORK PACKAGE

UNIT MAINTENANCE INSTRUCTIONS

ARMY SPACE HEATER H-140

NSN 4520-01-477-0568

CONTROL BOX COVER ASSEMBLY REMOVAL, DISASSEMBLY, REPAIR, ASSEMBLY, INSTALLATION

INITIAL SETUP:

Test Equipment
None

Tools and Special Tools
Automotive general mechanics tool kit (item 10, WP 0058 00)
Blind riveter (item 2, WP 0058 00)
Drill (item 6, WP 0058 00)
Drill bit (item 6, WP 0058 00)

Personnel Required
One

References
None

Materials/Parts
Lockwasher (item 27, WP 0062 00)
Rivet (item 3, WP 0062 00)
Rivet (item 6, WP 0062 00)
Rivet (item 9, WP 0062 00)

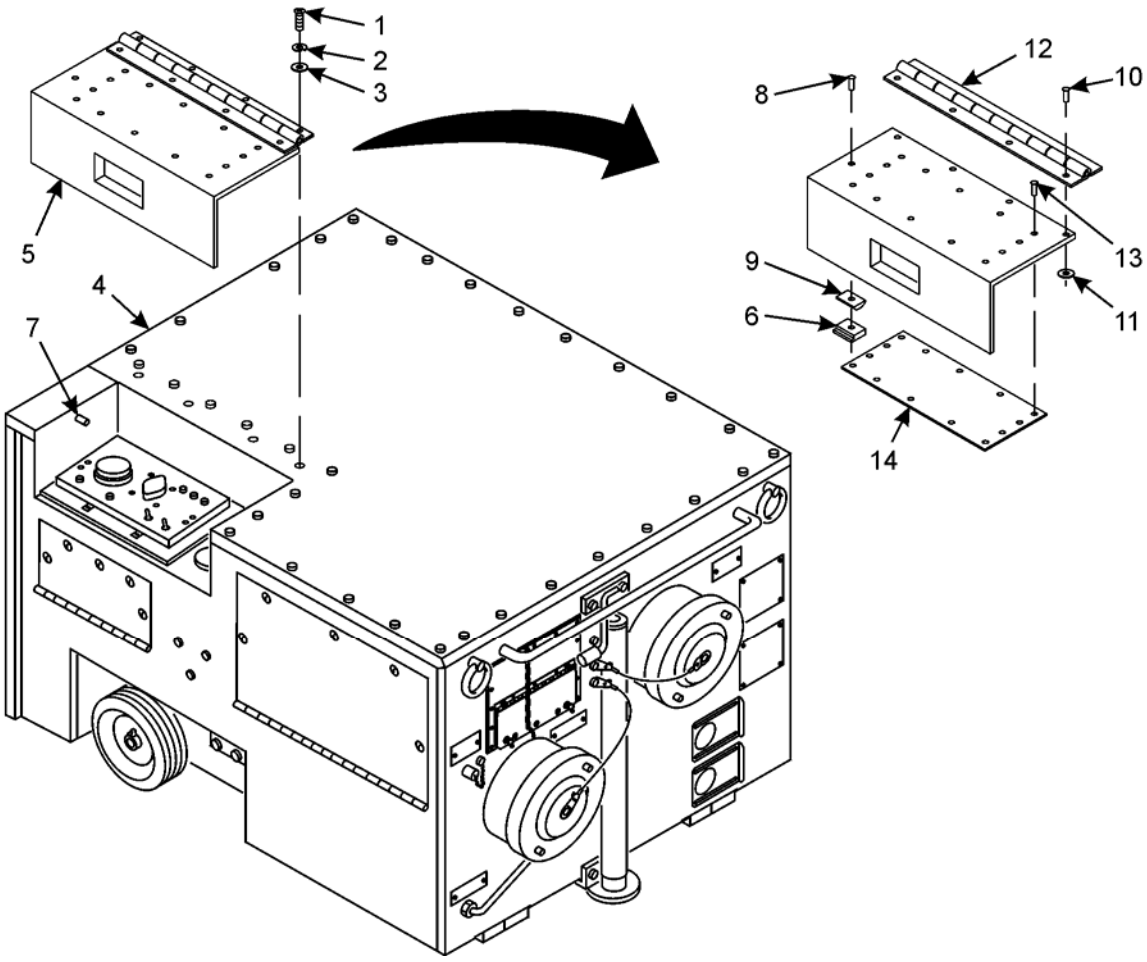
Equipment Condition
ASH disconnected from power source (WP 0005 00)

REMOVAL

1. Remove four screws (1), lockwashers (2), and washers (3) from ASH (4). Discard lockwashers.

2. Pull cover (5) up to unlatch clip (6) from bar (7) and remove cover.

REMOVAL – Continued



DISASSEMBLY

1. Drill out rivet (8) and remove clip (6) and spacer (9).
2. Drill out four rivets (10) to remove backing plates (11) and hinge (12).
3. Drill out six rivets (13) and remove instruction plate (14).

REPAIR

Repair is limited to replacement of defective parts.

ASSEMBLY

1. Position instruction plate (14) on inside of cover (5) with bottom toward hinge (12).
2. Install six rivets (13) (item 3, WP 0062 00).
3. Position hinge (12) on cover (5) and secure with four backing plates (11) and rivets (10) (item 6, WP 0062 00).
4. Position spacer (9) and clip (6) on inside of cover (5) and secure with rivet (8) (item 9, WP 0062 00).

INSTALLATION

1. Place cover (5) over ASH (4) so clip (6) alines with bar (7) and push down on cover.
2. Aline four holes in hinge (12) and ASH (4).
3. Install cover (5) with four washers (3), lockwashers (2), and screws (1).

END OF WORK PACKAGE

UNIT MAINTENANCE INSTRUCTIONS

ARMY SPACE HEATER H-140

NSN 4520-01-477-0568

TOP PANEL ASSEMBLY
REMOVAL, DISASSEMBLY, REPAIR, ASSEMBLY, INSTALLATION

INITIAL SETUP:

Test Equipment
None

Tools and Special Tools
Automotive general mechanic's tool kit (item 10, WP 0058 00)
Gasket punch (item 6, WP 0058 00)
Shears (item 6, WP 0058 00)

Personnel Required
One

References
None

Materials/Parts
Gasket (item 45, WP 0047 00)
Gasket (item 46, WP 0047 00)
Gasket (item 47, WP 0047 00)
Gasket (item 48, WP 0047 00)
Gasket (item 49, WP 0047 00)
Gasket (item 50, WP 0047 00)
Insulation (item 39, WP 0047 00)
Insulation (item 40, WP 0047 00)
Insulation (item 41, WP 0047 00)
Lockwasher (item 28, WP 0062 00)
Rubber adhesive (item 1, WP 0061 00)

Equipment Condition
ASH disconnected from power source (WP 0005 00)
Control box cover assembly removed (WP 0020 00)

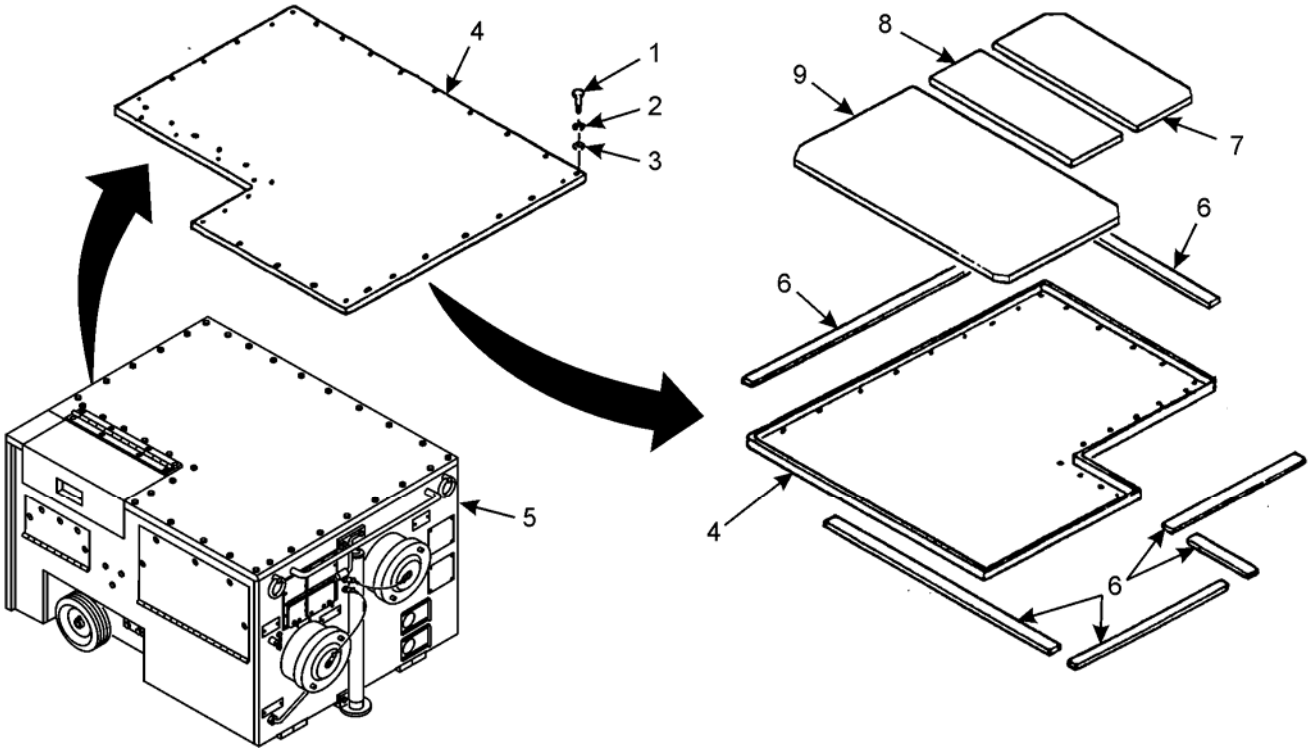
WARNING

Contact with hot components can cause burns. Allow ASH to cool down before attempting service, inspection, or maintenance activity.

REMOVAL

1. Remove 23 screws (1), lockwashers (2), and washers (3) from top panel (4). Discard lockwashers.
2. Remove top panel (4) from frame (5).

REMOVAL – Continued



DISASSEMBLY

1. Remove six parts of gasket (6).
2. Mark location of insulation (7, 8, and 9) and remove as required.

REPAIR

Repair is limited to replacement of defective parts.

ASSEMBLY

WARNING

Rubber adhesive is flammable. Keep away from open flames or other sources of ignition. Avoid breathing fumes from adhesive. Good general ventilation is normally adequate. Avoid skin contact with adhesive.

1. If insulation has been removed, apply rubber adhesive to insulation (9, 8, and 7) (items 39, 41, and 40, WP 0047 00).
2. Install six parts of gasket (6) (items 45 thru 50, WP 0047 00).

INSTALLATION

1. Position top panel (4) on top of frame (5).
2. Install 23 washers (3), lockwashers (2), and screws (1).

END OF WORK PACKAGE

UNIT MAINTENANCE INSTRUCTIONS

ARMY SPACE HEATER H-140

NSN 4520-01-477-0568

REAR PANEL ASSEMBLY
REMOVAL, DISASSEMBLY, REPAIR, ASSEMBLY, INSTALLATION

INITIAL SETUP:

Test Equipment
None

Tools and Special Tools
Automotive general mechanic's tool kit (item 10, WP 0058 00)
Blind riveter (item 2, WP 0058 00)
Drill (item 6, WP 0058 00)
Drill bit (item 6, WP 0058 00)
Gasket punch (item 6, WP 0058 00)
Shears (item 6, WP 0058 00)
Soft-faced vice (item 6, WP 0058 00)

Personnel Required
One

References
FM 10-67-1

Materials/Parts
Cable (item 70, WP 0047 00)
Gasket (item 43, WP 0047 00)
Gasket (item 44, WP 0047 00)

Materials/Parts – Continued
Gasket (item 65, WP 0047 00)
Gasket (item 66, WP 0047 00)
Gasket (item 67, WP 0047 00)
Gasket material (item 9, WP 0061 00)
Insulation (item 20, WP 0047 00)
Insulation (item 30, WP 0047 00)
Insulation (item 95, WP 0047 00)
Lockwasher (item 28, WP 0062 00)
Lockwasher (item 29, WP 0062 00)
Rivet (item 4, WP 0062 00)
Rivet (item 6, WP 0062 00)
Rivet (item 8, WP 0062 00)
Rubber adhesive (item 1, WP 0061 00)
Sealing compound (item 16, WP 0061 00)
Sealing compound (item 17, WP 0061 00)
Tube (item 81, WP 0047 00)

Equipment Condition
ASH disconnected from power source (WP 0005 00)
Exhaust pipe and elbow removed (WP 0018 00)
Top panel assembly removed (WP 0021 00)

WARNING

Contact with hot components can cause burns. Allow ASH to cool down before attempting service, inspection, or maintenance activity.

FOR FUEL SPILLS, REFER TO FM 10-67-1, CONCEPTS AND EQUIPMENT OF PETROLEUM OPERATIONS.

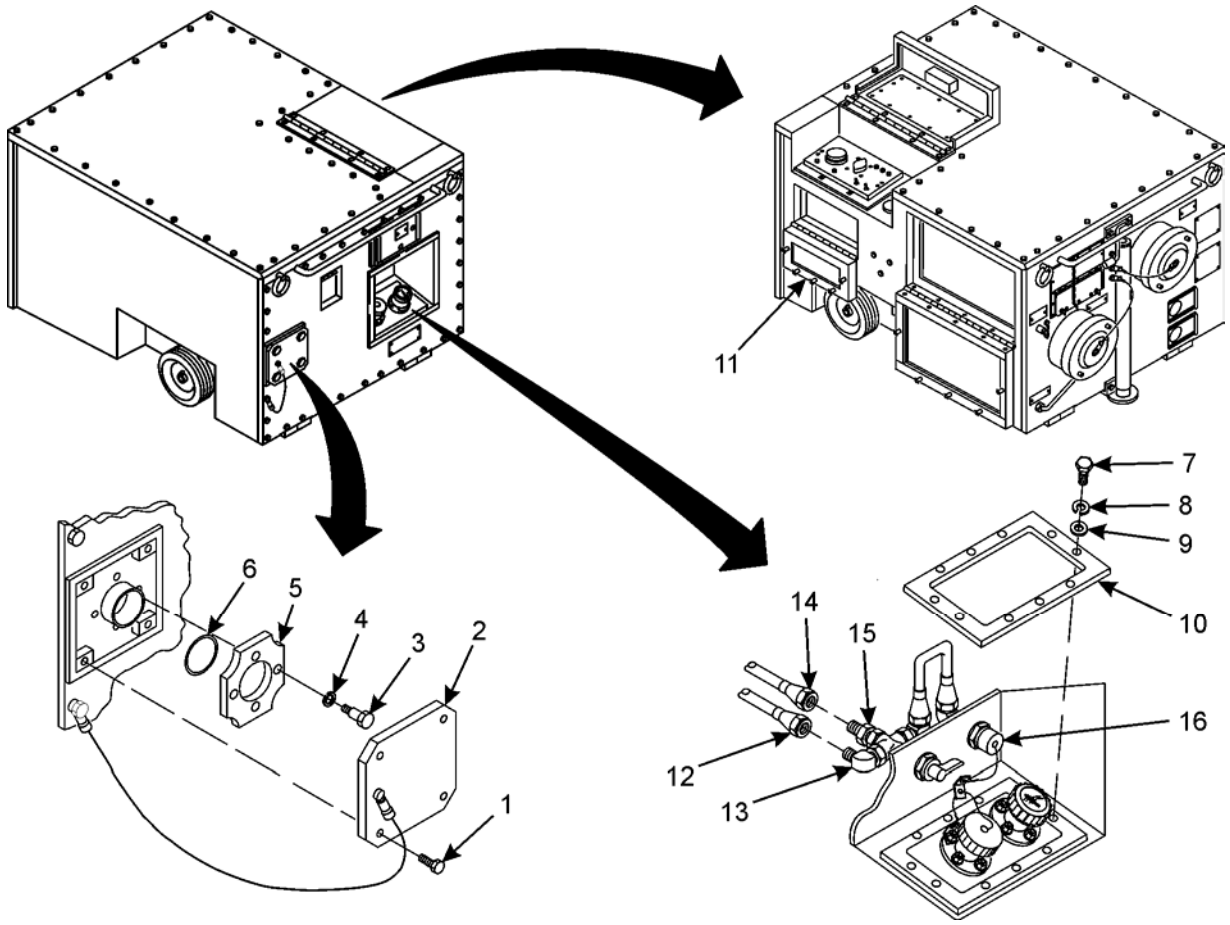
Fuel is flammable and toxic to eyes, skin, and respiratory tract. Skin/eye protection is required. Avoid repeated/prolonged contact. Use only in well-ventilated areas. Keep away from open flames or other sources of ignition. Post FUEL FLAMMABLE/NO SMOKING signs around the area. Be sure a fire extinguisher is available.

Fuel on clothing can be fatal if ignited by a static discharge. If fuel gets on clothes, leave the refueling area as soon as possible, remove clothes, and wash skin with warm, soapy water before getting dressed.

Spilled fuel creates a flammable, vapor-air mixture and fire can take place. Improper positioning of external fuel source can cause fuel tank to overflow. Stop refueling immediately if fuel spill occurs.

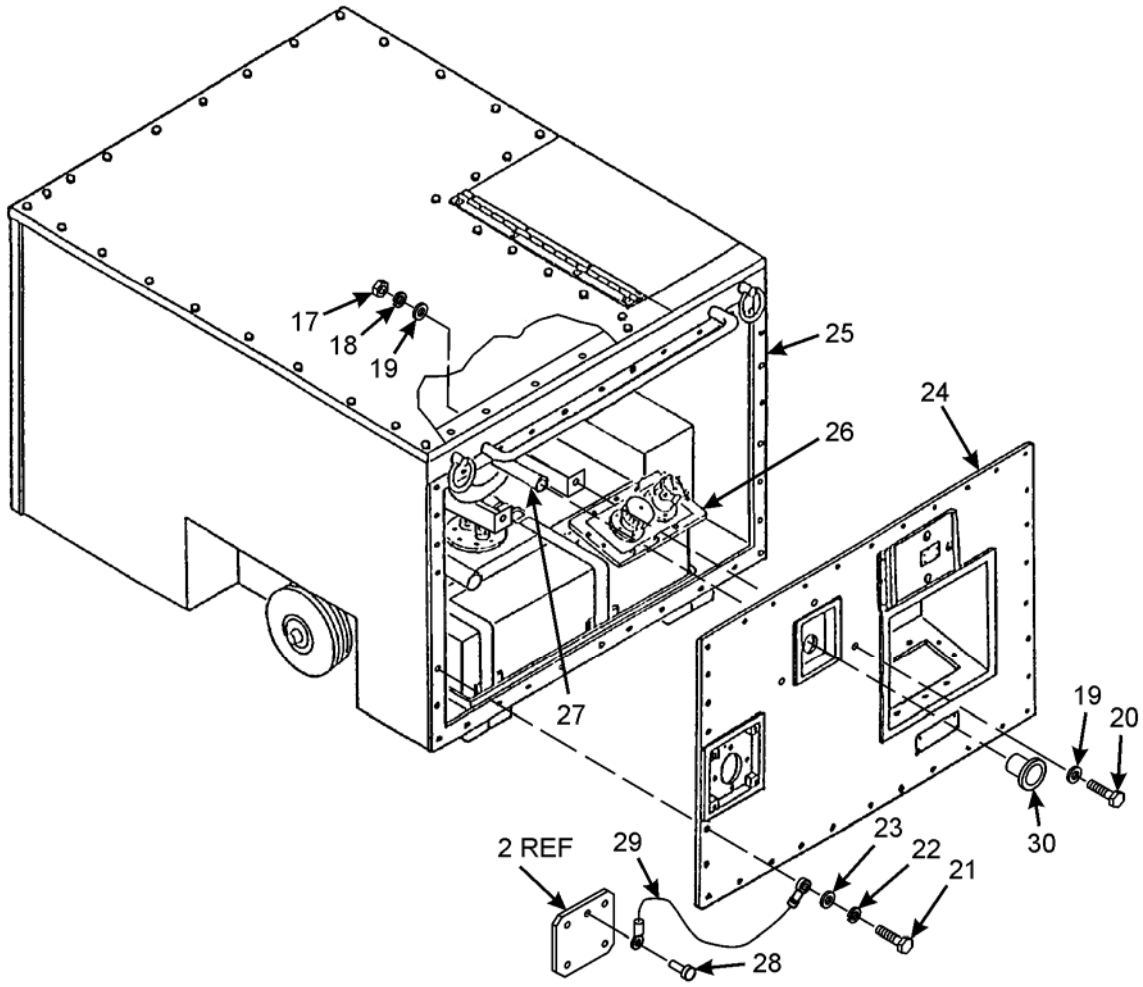
REMOVAL

1. Remove four screws (1) and exhaust protective cover (2).
2. Remove four screws (3), four lockwashers (4), seal plate (5), and gasket material (6). Discard lockwashers.
3. Remove ten screws (7), lockwashers (8), washers (9), and isolator frame (10). Discard lockwashers.
4. Open side rear door (11).
5. Disconnect tube assembly (12) from elbow (13) and tube assembly (14) from straight connector (15). Cover tube assemblies (12 and 14) to prevent any foreign matter from entering tube assembly. Remove dust cap (16).



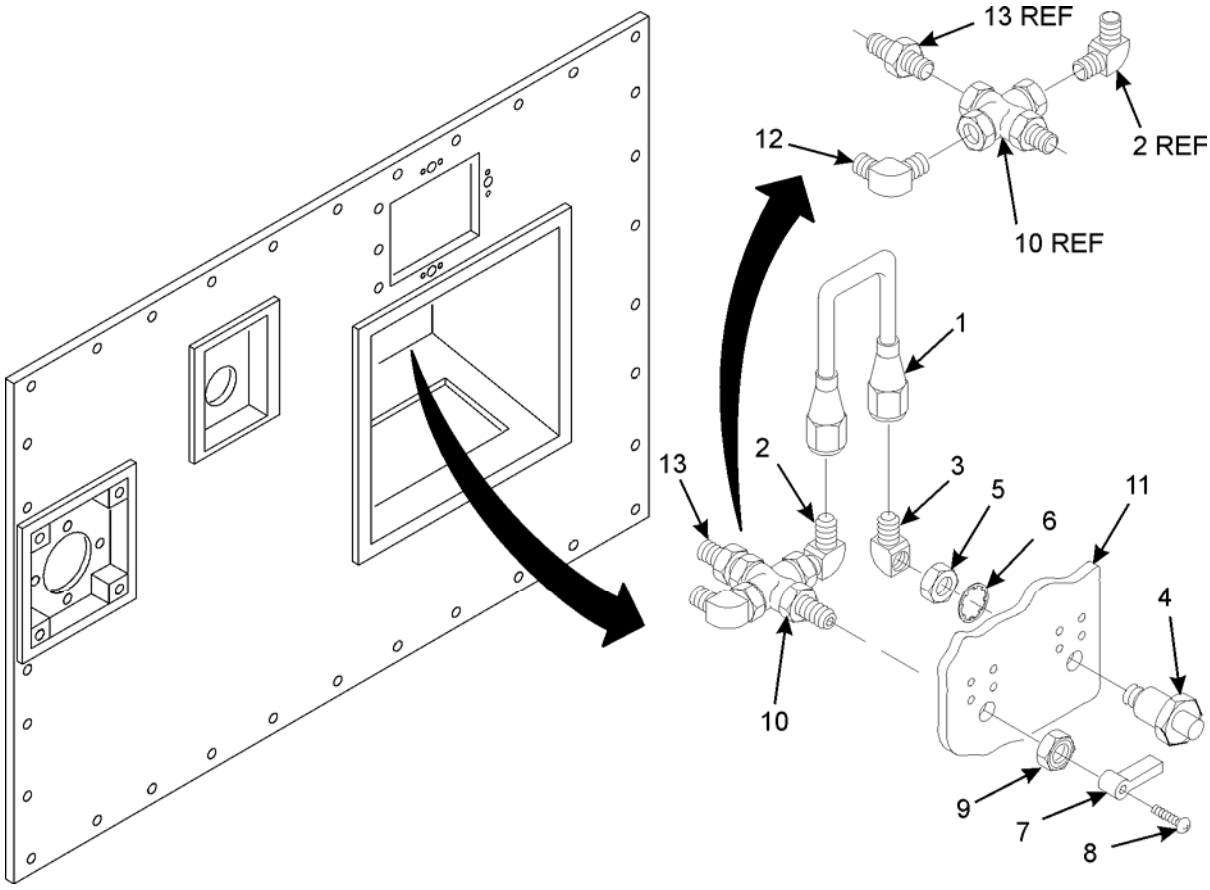
REMOVAL – Continued

6. Remove three nuts (17), lockwashers (18), six washers (19), and three screws (20). Discard lockwashers.
7. Remove 18 screws (21), lockwashers (22), washers (23), and cover (2). Discard lockwashers.
8. Remove rear panel assembly (24) from frame (25) by gently pulling panel from isolator (26) and sight tube (27).
9. Drill out rivet (28) and remove cable (29) from cover (2).
10. Remove sight tube adapter (30) from rear panel assembly (24).
11. Clean sealing compound from sight tube adapter (30) and rear panel assembly (24).



DISASSEMBLY

1. Remove tube assembly (1) from elbows (2 and 3).
2. Remove elbow (3) from quick-disconnect coupling (4).
3. Remove nut (5), lockwasher (6), and quick-disconnect coupling (4).
4. Position selector handle (7) in EXTERNAL position and remove screw (8) and handle (7).
5. Remove nut (9) and selector valve (10) from rear panel (11).
6. Place selector valve (10) in a soft-faced vise and remove elbows (2 and 12) and straight connector (13). Remove selector valve from vise.



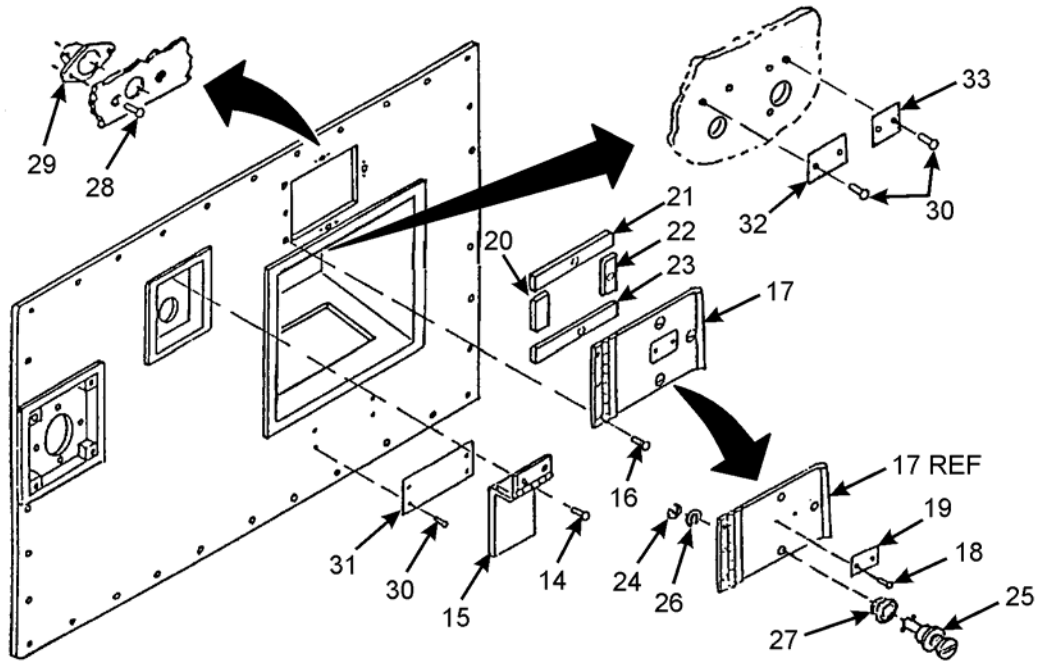
DISASSEMBLY – Continued

7. Drill out two rivets (14) and remove sight glass cover (15).
8. Drill out three rivets (16) and remove exhaust pipe storage door (17).
9. Drill out two rivets (18) and remove information plate (19).
10. Remove gaskets (20 thru 23).
11. Remove three stud retaining rings (24) and three studs (25).
12. Remove three retaining rings (26) and three grommets (27).
13. Drill out six rivets (28) and remove three receptacles (29).

NOTE

Information plates are attached using two or four rivets each. Remove the quantity of rivets the configuration requires.

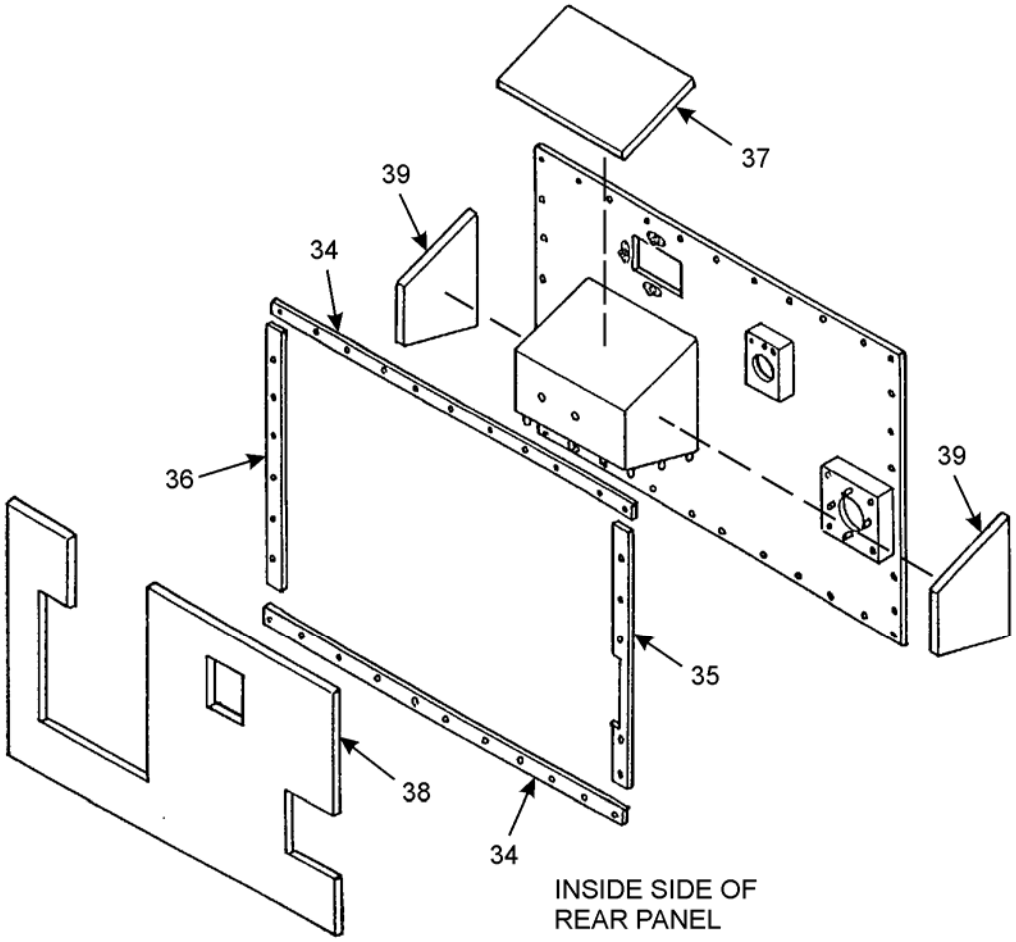
14. Drill out eight rivets (30) and remove information plates (31, 32, and 33) as required.



DISASSEMBLY – Continued

15. Remove two gaskets (34) and gaskets (35 and 36).

16. Remove insulation pieces (37 and 38) and two pieces of insulation (39) as required.



REPAIR

1. Repair is limited to replacement of defective parts.

2. Inspect rear panel assembly for cracks. Notify direct support maintenance to have cracks welded.

ASSEMBLY

WARNING

Rubber adhesive is flammable. Keep away from open flames or other sources of ignition. Avoid breathing fumes from adhesive. Good general ventilation is normally adequate. Avoid skin contact with adhesive.

1. Apply rubber adhesive to center area of insulation (39, 38, and 37) (items 30, 95, and 20, WP 0047 00) and mating surfaces and install insulation.

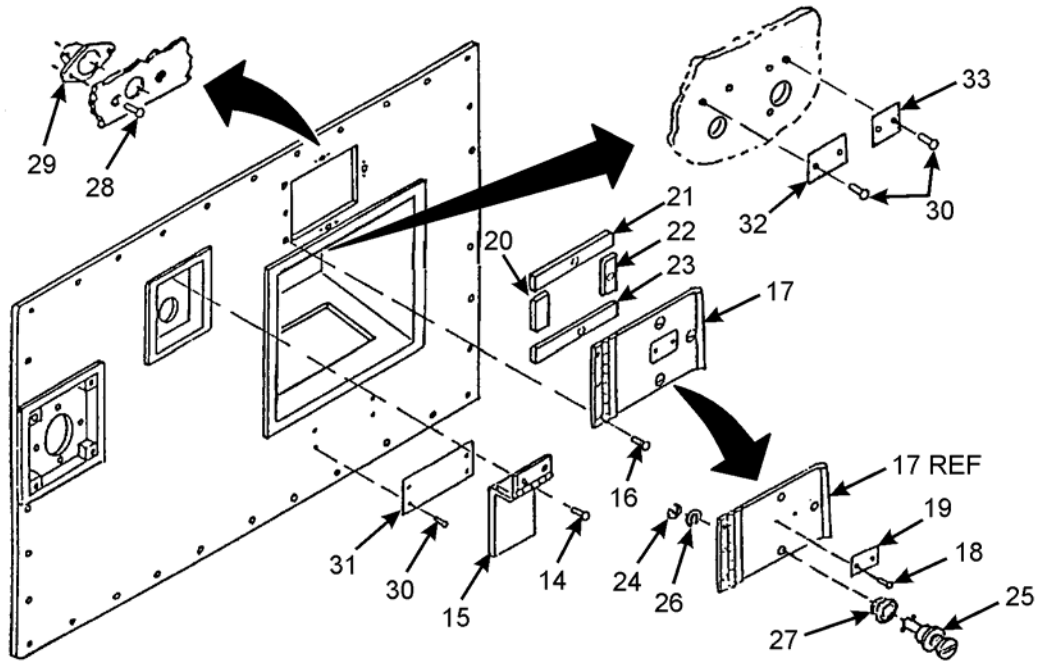
2. Install gaskets (36 and 35) (items 66 and 67, WP 0047 00) and two gaskets (34) (item 65, WP 0047 00).

ASSEMBLY – Continued

NOTE

Information plates are attached using two or four rivets each. Install the quantity of rivets the configuration requires.

3. Install information plates (33, 32, and 31) with eight rivets (30) (item 4, WP 0062 00) as required.
4. Install three receptacles (29) with six rivets (28) (item 6, WP 0062 00).
5. Install three grommets (27) and three retaining rings (26).
6. Install three studs (25) and three stud retaining rings (24).
7. Install gaskets (23 and 21) (item 44, WP 0047 00) and gaskets (22 and 20) (item 43, WP 0047 00).
8. Install information plate (19) with two rivets (18) (item 4, WP 0062 00).
9. Install exhaust pipe storage door (17) with three rivets (16) (item 8, WP 0062 00).
10. Install sight glass cover (15) with two rivets (14) (item 8, WP 0062 00).



ASSEMBLY – Continued

11. Hold selector valve (10) in left hand with half-moon shaped handle stop on top and proceed as follows:

    a. Look in right side opening to ensure that valve is open to that side.

    b. If it is not, use handle to turn valve stem 180 degrees (3200 mils).

12. Apply sealing compound (item 17, WP 0061 00) to male threads of elbows (2 and 12) and straight connector (13).

13. Place selector valve (10) in soft-faced vise and install elbows (3 and 12) and straight connector (13). Remove selector valve (10) from vise.

14. Install selector valve (10), with half-moon shaped handle stop on top, on rear panel (11) and install nut (9).

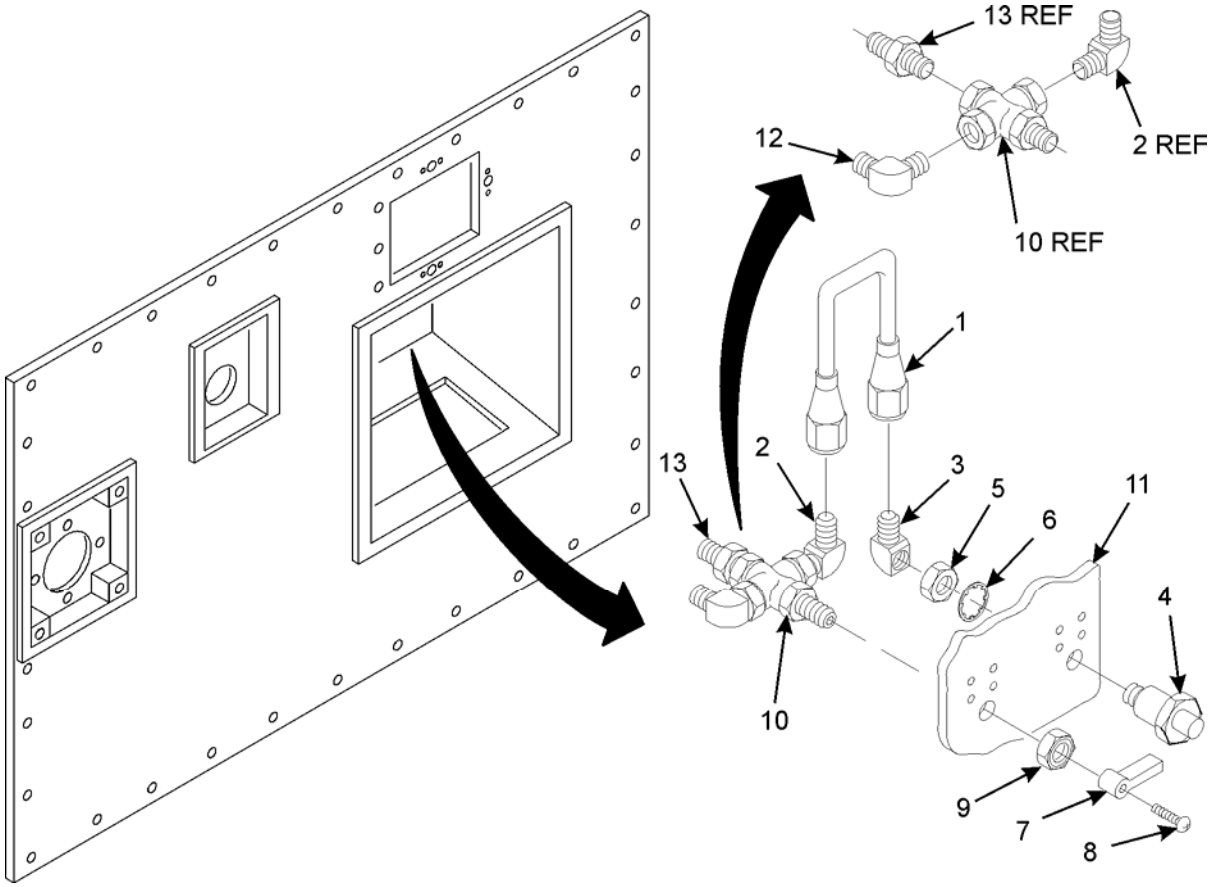
15. Install selector handle (7) and screw (8).

16. Install quick-disconnect coupling (4), lockwasher (6), and nut (5).

17. Apply sealing compound (item 17, WP 0061 00) to male threads of elbows (3 and 2).

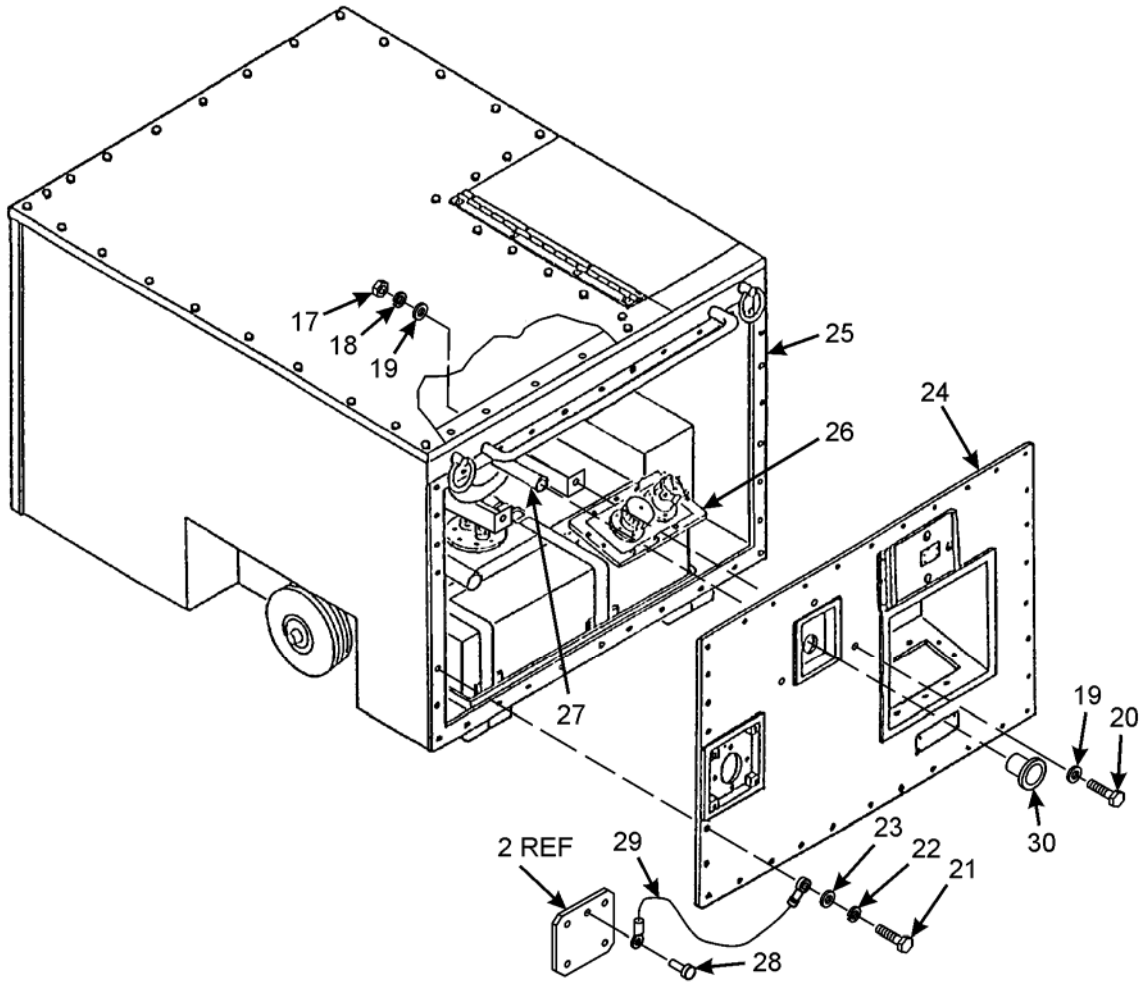
18. Install elbow (3) onto quick-disconnect coupling (4).

19. Install tube assembly (1) onto elbows (3 and 2).



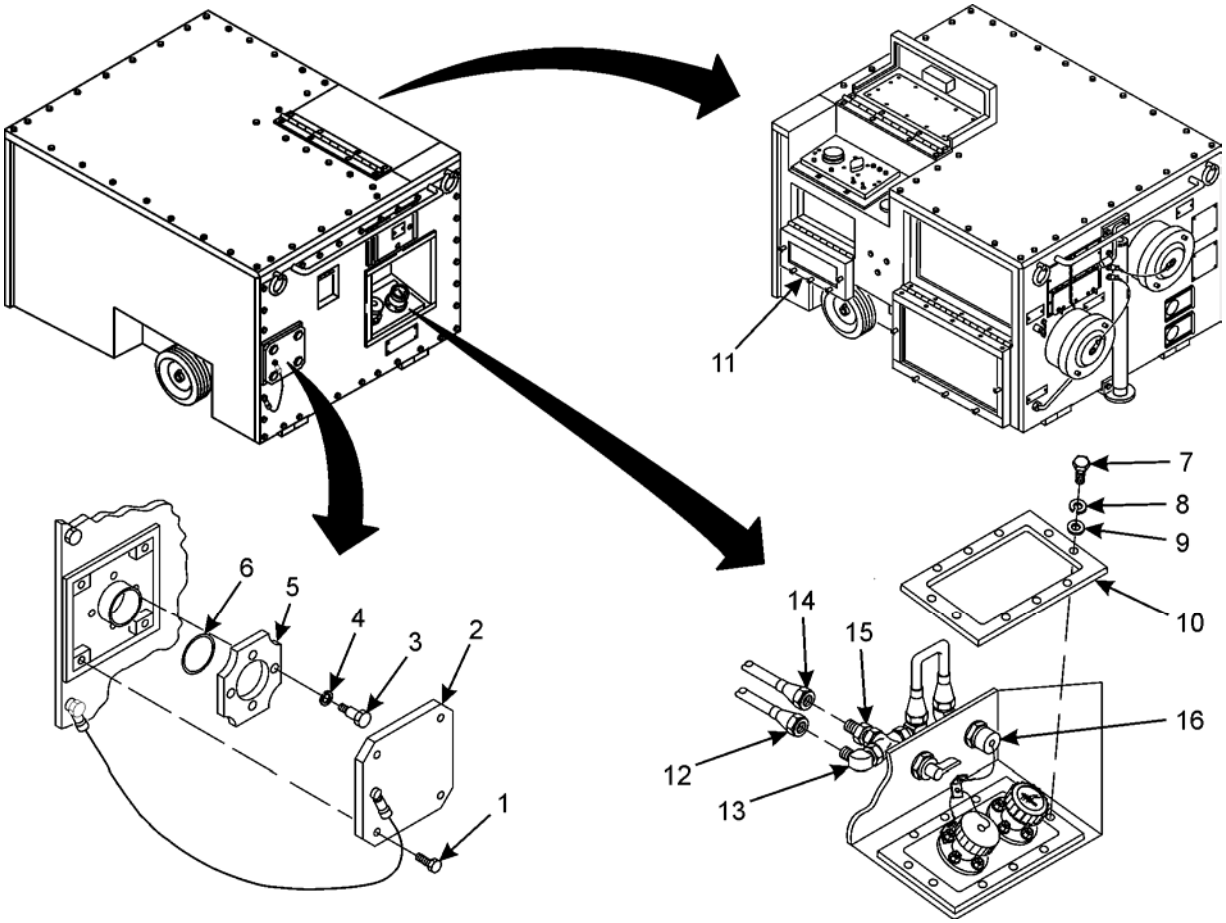
INSTALLATION

1. Apply a bead of sealing compound (item 16, WP 0061 00) to inside flange of sight tube adapter (30).
2. Install sight tube adapter (30) onto rear panel assembly (24).
3. Install rear panel assembly (24) onto frame (25) over isolator (26) and sight tube (27), gently pulling isolator through rear panel assembly so it rests on outside of rear panel assembly.
4. Install cable (29) onto cover (2) with rivet (28) (item 8, WP 0062 00).
5. Install cover (2), 18 washers (23), lockwashers (22) (item 28, WP 0062 00), and screws (21).
6. Install three screws (20), six washers (19), three lockwashers (18) (item 28, WP 0062 00), and nuts (17).



INSTALLATION – Continued

7. Install dust cap (16).
8. Apply sealing compound (item 17, WP 0061 00) to threads of elbow (13) and straight connector (15).
9. Remove any covers from tube assemblies (14 and 12).
10. Open side rear door (11) and connect tube assembly (14) to straight connector (15) and connect tube assembly (12) to elbow (13).
11. Install isolator frame (10), ten washers (9), lockwashers (8) (item 28, WP 0062 00) and screws (7).
12. Apply gasket material (6) (item 9, WP 0061 00) around exhaust pipe.
13. Install seal plate (5), four lockwashers (4) (item 29, WP 0062 00), and screws (3).
14. Install exhaust protective cover (2) and four screws (1).



END OF WORK PACKAGE

UNIT MAINTENANCE INSTRUCTIONS

ARMY SPACE HEATER H-140

NSN 4520-01-477-0568

SIDE REAR DOOR AND SIDE FRONT DOOR ASSEMBLIES REMOVAL, DISASSEMBLY, REPAIR, ASSEMBLY, INSTALLATION

INITIAL SETUP:

Test Equipment
None

Tools and Special Tools
Automotive general mechanic's tool kit (item 10, WP 0058 00)
Blind riveter (item 2, WP 0058 00)
Drill (item 6, WP 0058 00)
Drill bit (item 6, WP 0058 00)
Gasket punch (item 6, WP 0058 00)
Shears (item 6, WP 0058 00)

Personnel Required
One

References
None

Materials/Part
Gasket (item 55, WP 0047 00)
Gasket (item 56, WP 0047 00)
Gasket (item 57, WP 0047 00)
Gasket (item 58, WP 0047 00)
Gasket (item 59, WP 0047 00)
Gasket (item 60, WP 0047 00)
Insulation (item 28, WP 0047 00)
Insulation (item 29, WP 0047 00)
Lockwasher (item 21, WP 0062 00)
Rivet (item 7, WP 0062 00)
Rivet (item 8, WP 0062 00)
Rubber adhesive (item 1, WP 0061 00)

Equipment Condition
ASH disconnected from power source (WP 0005 00)

WARNING

Contact with hot components can cause burns. Allow ASH to cool down before attempting service, inspection, or maintenance activity.

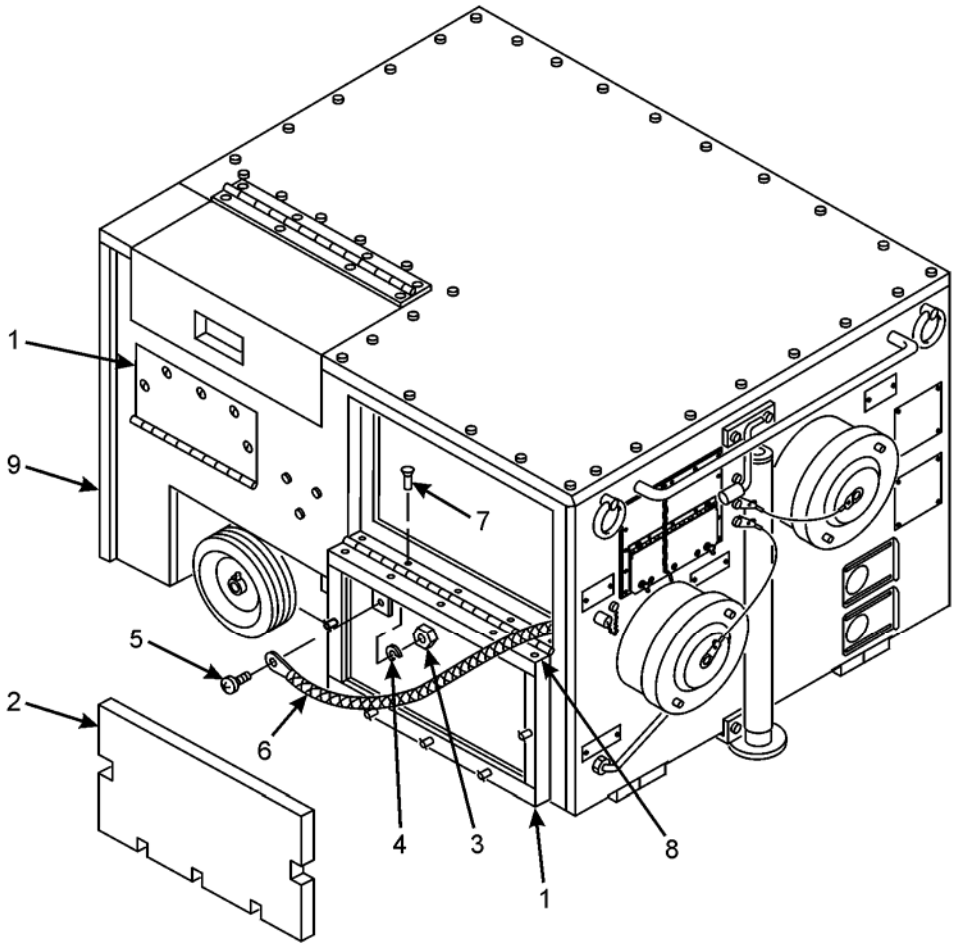
NOTE

Side rear door and side front door assemblies are similar in construction. The differences are in the size and the number of rivets used to secure the hinges. The side rear door is smaller and uses four rivets while the side front door is larger and uses five rivets. Procedures are typical for both door assemblies.

REMOVAL

1. Open either door (1).
2. Remove insulation (2).
3. Remove nut (3), lockwasher (4), screw (5), and ground wire (6). Discard lockwasher.
4. Drill out rivets (7) from hinge (8) and frame (9).

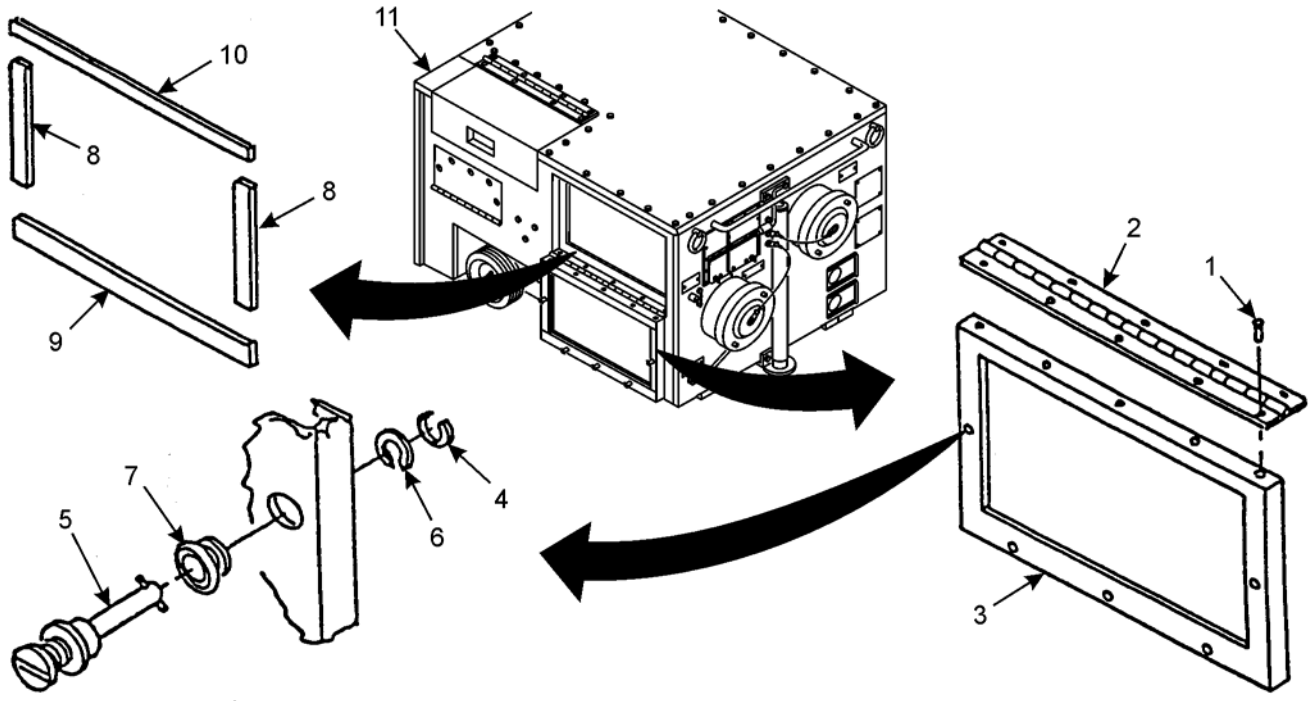
REMOVAL – Continued



DISASSEMBLY – Continued

DISASSEMBLY

1. Drill out rivets (1) and remove hinge (2) from door (3).
2. Remove five stud retaining rings (4) and stud assemblies (5).
3. Remove five split washers (6) and grommets (7).
4. Remove two gaskets (8) and gaskets (9 and 10) from frame (11).



REPAIR

Repair is limited to replacement of defective parts.

ASSEMBLY

1. Install gasket (10) (item 60 or 57, WP 0047 00), gasket (9) (item 58 or 55, WP 0047 00), and two gaskets (8) (item 59 or 56, WP 0047 00) onto frame (11).
2. Install five grommets (7) and split washers (6).
3. Install five stud assemblies (5) and stud retainer rings (4).
4. Install hinge (2) and rivets (1) (item 7, WP 0062 00) onto door (3).

INSTALLATION

1. Install hinge (8) with rivets (7) (item 8, WP 0062 00) onto frame (9).

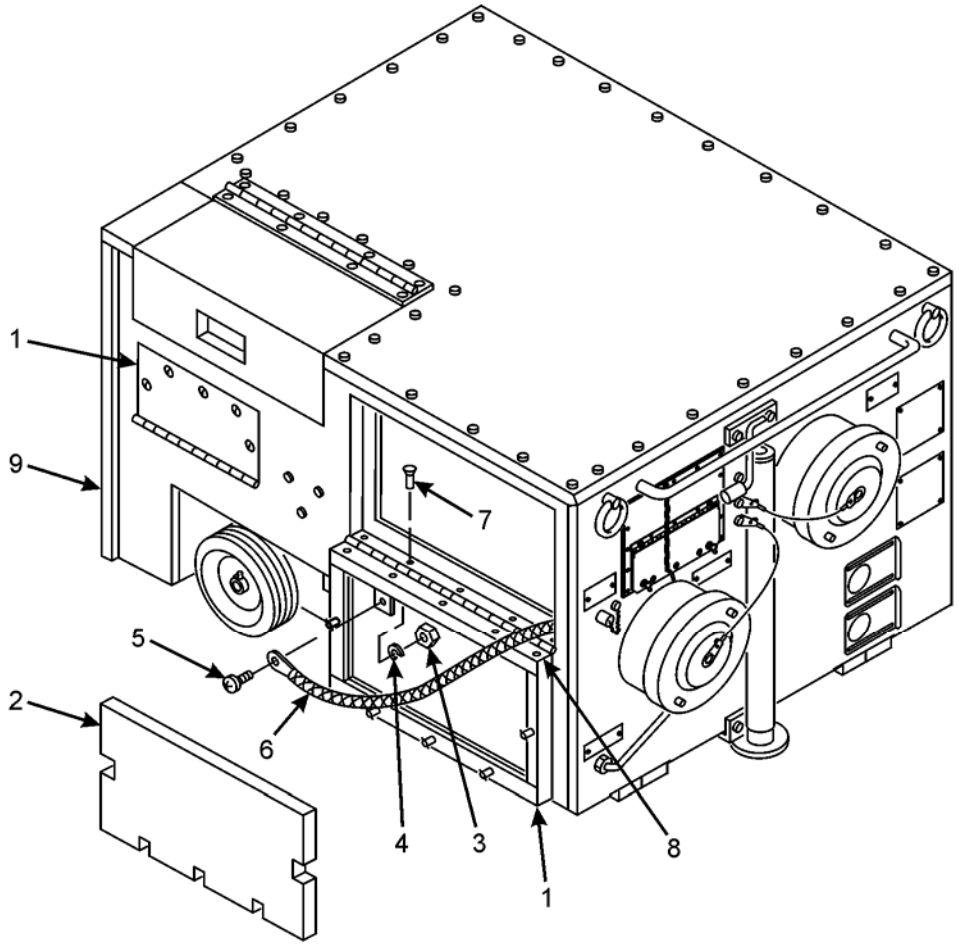
2. Install ground wire (6), screw (5), lockwasher (4), and nut (3).

WARNING

Rubber adhesive is flammable. Keep away from open flames or other sources of ignition. Avoid breathing fumes from adhesive. Good general ventilation is normally adequate. Avoid skin contact with adhesive.

3. Apply rubber adhesive to center area of insulation (2) (item 28 or 29, WP 0047 00) and mating surfaces and install insulation.

4. Close door (1).



END OF WORK PACKAGE

UNIT MAINTENANCE INSTRUCTIONS

ARMY SPACE HEATER H-140

NSN 4520-01-477-0568

SUPPLY AND RETURN DUCT COVER ASSEMBLIES REMOVAL, INSPECTION, REPAIR, INSTALLATION

INITIAL SETUP:

Test Equipment
None

Tools and Special Tools
Automotive general mechanic's tool kit (item 10, WP 0058 00)

Personnel Required
One

References
None

Materials/Parts
Cable (item 71, WP 0047 00)
Locknut (item 14, WP 0062 00)
Lockwasher (item 27, WP 0062 00)

Equipment Condition
ASH disconnected from power source (WP 0005 00)

WARNING

Contact with hot components can cause burns. Allow ASH to cool down before attempting service, inspection, or maintenance activity.

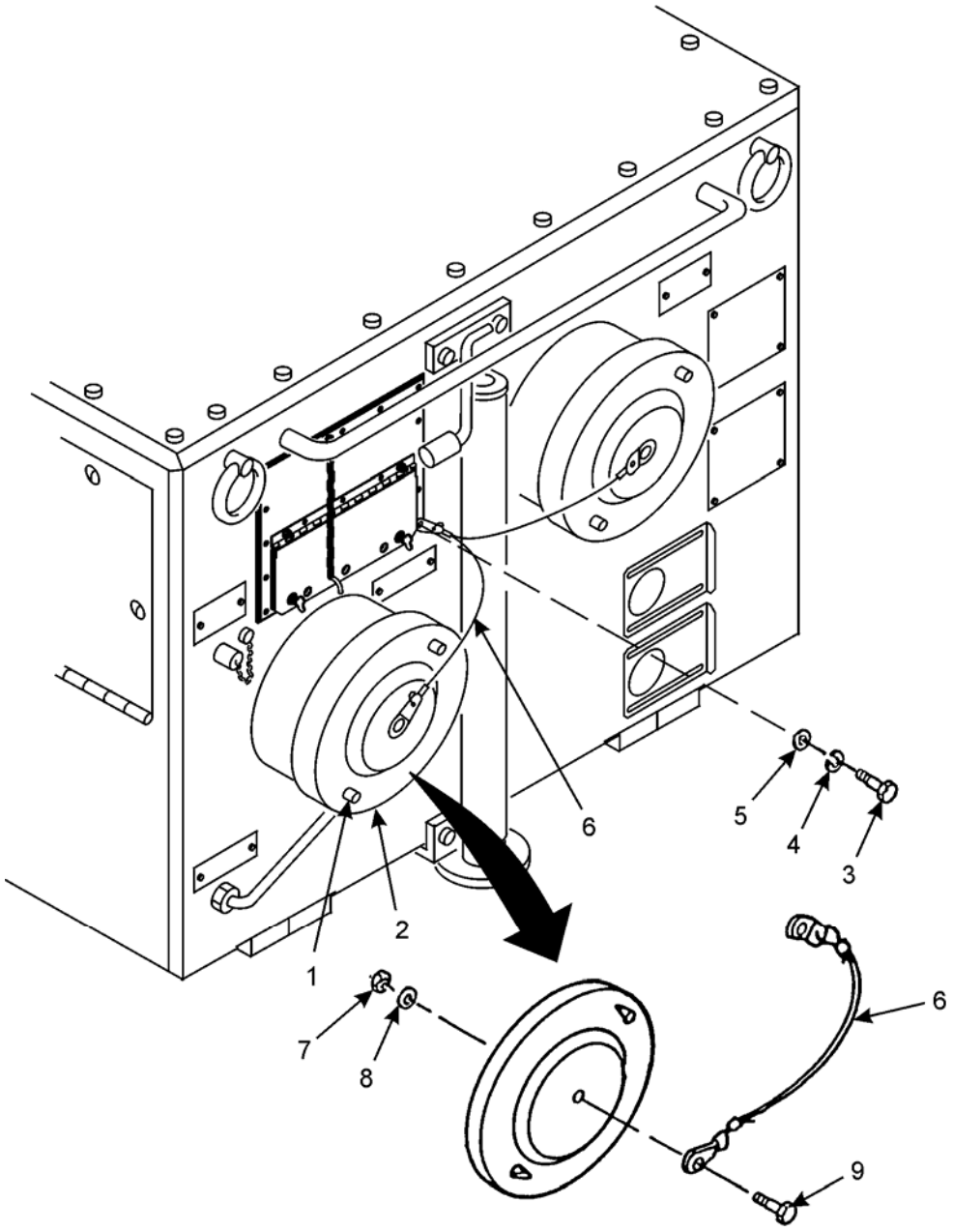
NOTE

Procedures are typical for the supply and return duct cover assemblies.

REMOVAL

1. Loosen two screws (1) and remove duct cover assembly (2).
2. Remove screw (3), lockwasher (4), washer (5), and cable (6). Discard lockwasher.

REMOVAL – Continued



INSPECTION

1. Inspect cover for cracks and holes.
2. Inspect cable assembly for fraying cable and missing hardware.

REPAIR

1. Repair of duct cover assembly (2) is limited to replacement of defective parts.
2. If cable assembly (6) is defective, fabricate new cable assembly.
3. Remove locknut (7), washer (8), screw (9), and cable assembly (6) from duct cover assembly (2). Discard locknut.
4. Attach cable assembly (6) onto duct cover assembly (2) with screw (9), washer (8), and locknut (7).

INSTALLATION

1. Install cable (6), washer (5), lockwasher (4), and screw (3).
2. Aline duct cover assembly (2) so two screws (1) protrude through cover.
3. Rotate duct cover assembly (2) to engage two screws (1) and tighten screws.

END OF WORK PACKAGE

UNIT MAINTENANCE INSTRUCTIONS

ARMY SPACE HEATER H-140

NSN 4520-01-477-0568

SUPPLY AND RETURN DUCT AIR SCREENS REMOVAL, INSPECTION, INSTALLATION

INITIAL SETUP:

Test Equipment
None

Tools and Special Tools
Automotive general mechanic's tool kit (item 10, WP 0058 00)

Personnel Required
One

References
None

Materials/Parts
Lockwasher (item 27, WP 0062 00)
Wiping rag (item 14, WP 0061 00)

Equipment Condition
ASH disconnected from power source (WP 0005 00)
Supply and return duct cover assemblies removed (WP 0024 00)

WARNING

Contact with hot components can cause burns. Allow ASH to cool down before attempting service, inspection, or maintenance activity.

NOTE

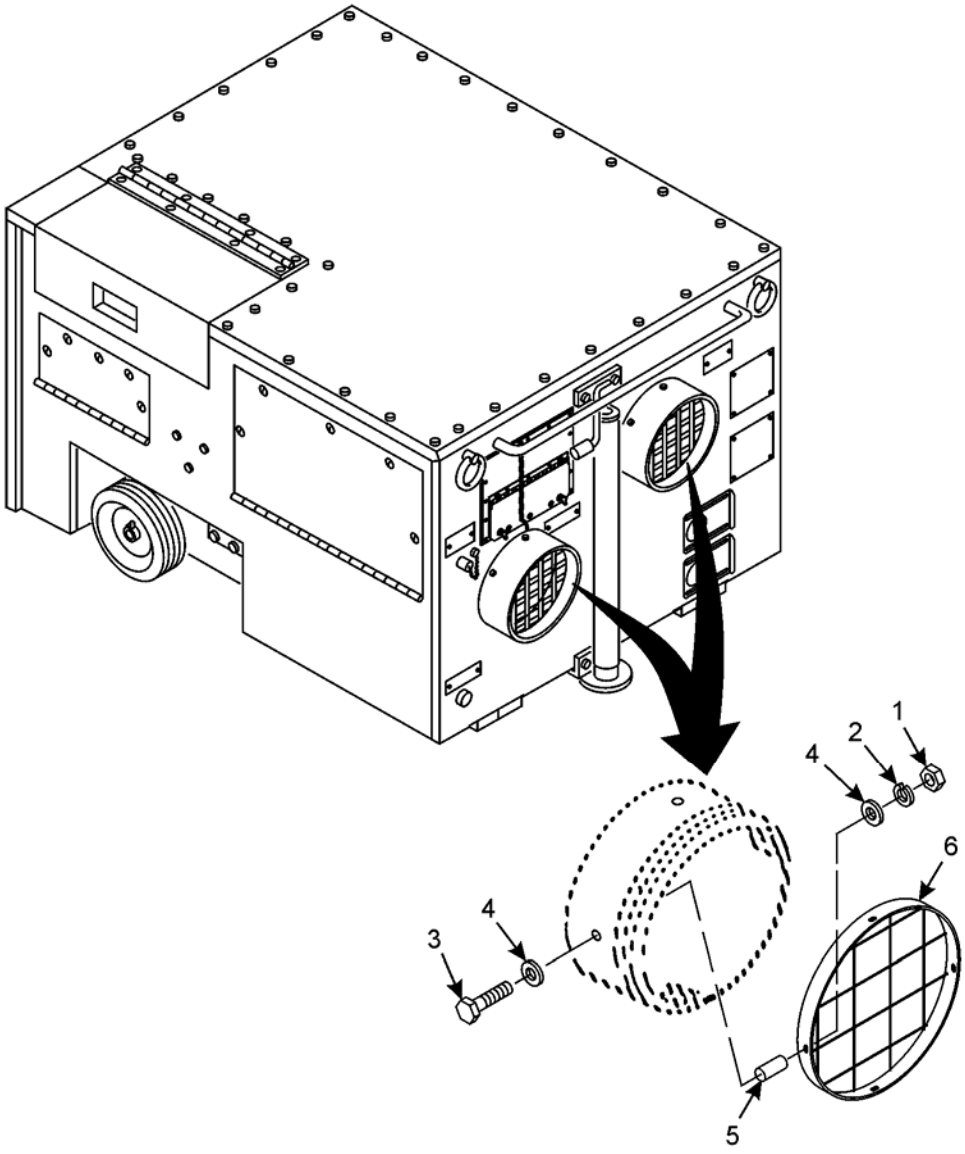
Procedures are typical for the supply and return duct air screens.

REMOVAL

1. Remove four nuts (1), lockwashers (2), screws (3), eight washers (4), four spacers (5), and duct air screen (6). Discard lockwashers.

2. Repeat step 1 to remove second duct air screen (6).

REMOVAL – Continued



INSPECTION

1. Inspect duct air screen (6) for dirt, grease, and soot.
2. Clean with wiping rag.
3. Inspect duct air screen (6) for broken wire mesh and cracked welds.

INSTALLATION

Install duct air screen (6) with four spacers (5), eight washers (4), four screws (3), lockwashers (2), and nuts (1).

END OF WORK PACKAGE

UNIT MAINTENANCE INSTRUCTIONS

ARMY SPACE HEATER H-140

NSN 4520-01-477-0568

ELECTRICAL CONTROL ASSEMBLY DISASSEMBLY, INSPECTION, REPAIR, ASSEMBLY

INITIAL SETUP:

Test Equipment
Multimeter (item 1, WP 0058 00)

Tools and Special Tools
Automotive general mechanic's tool kit (item 10, WP 0058 00)
Drill (item 6, WP 0058 00)
Drill bit (item 6, WP 0058 00)
Gasket punch (item 6, WP 0058 00)
Rivnut tool (item 3, WP 0058 00)
Shears (item 6, WP 0058 00)

Personnel Required
One

References
None

Materials/Parts
Acrylic lacquer sealer (item 15, WP 0061 00)
Gasket (item 51, WP 0047 00)
Lockwasher (item 20, WP 0062 00)
Lockwasher (item 22, WP 0062 00)
Lockwasher (item 23, WP 0062 00)
Lockwasher (item 27, WP 0062 00)
Lockwasher (item 31, WP 0062 00)
Rivnut (item 12, WP 0062 00)
Wire marker tag (item 25, WP 0061 00)
Wire tie (item 24, WP 0061 00)

Equipment Condition
ASH disconnected from power source (WP 0005 00)

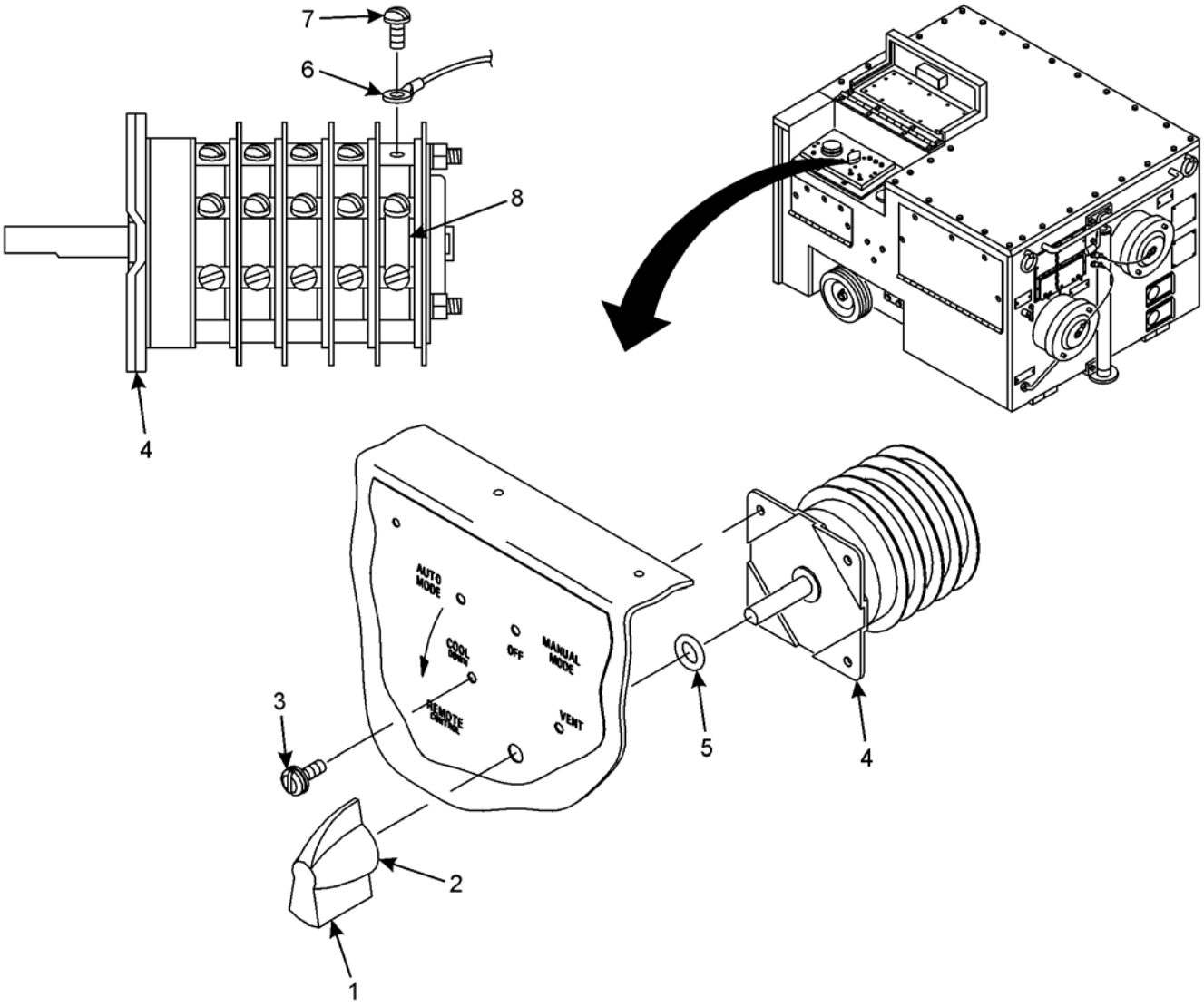
WARNING

Contact with hot components can cause burns. Allow ASH to cool down before attempting service, inspection, or maintenance activity.

DISASSEMBLY

MODE SWITCH S1 Removal

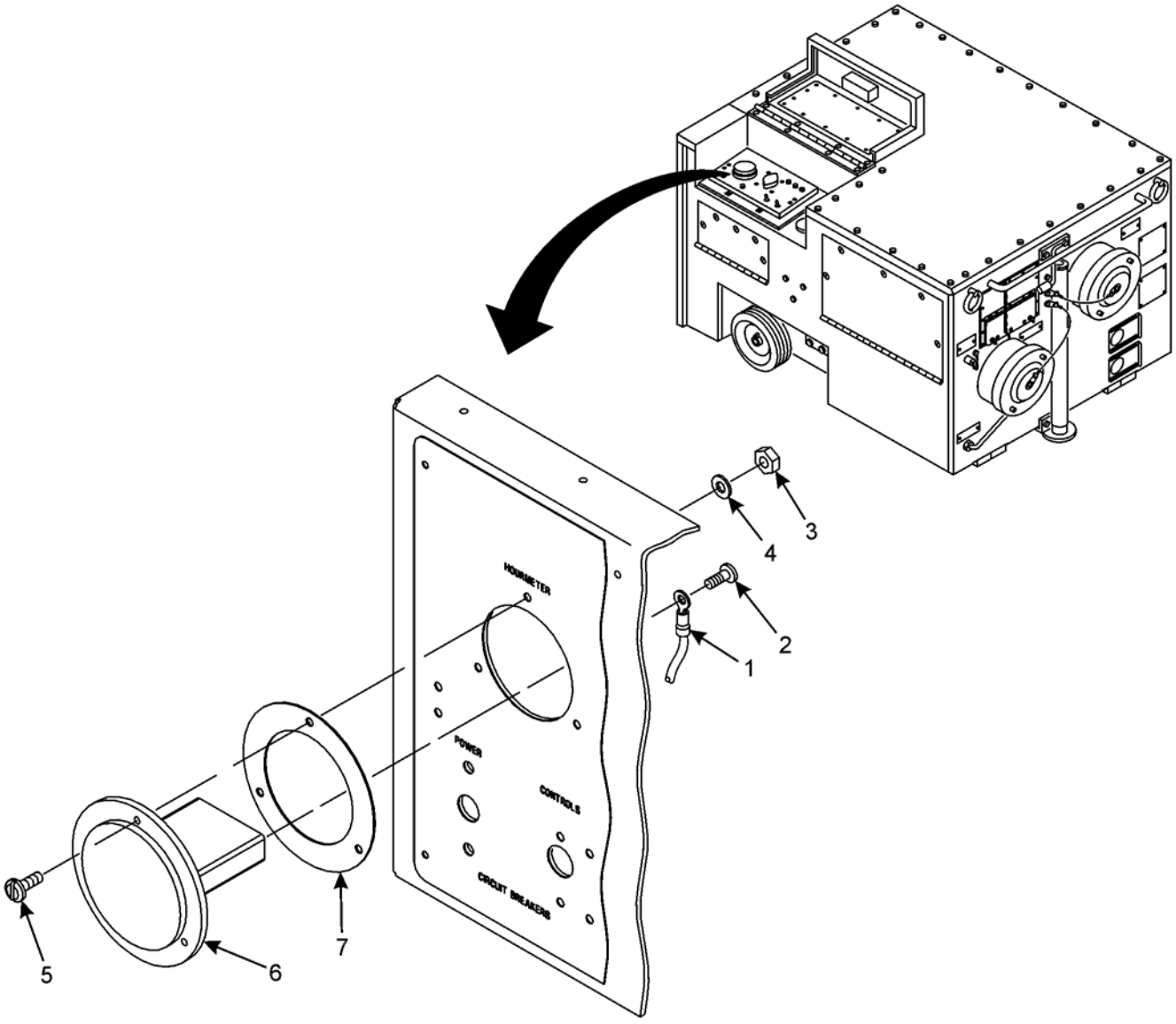
1. Loosen setscrew (1) and remove knob (2).
2. Remove four sealing screws (3) and MODE SWITCH S1 (4).
3. Remove preformed packing (5) from shaft of MODE SWITCH S1 (4).
4. Tag all wires (6).
5. Remove screws (7), wires (6), and jumpers (8).



DISASSEMBLY – Continued

HOURMETER Removal

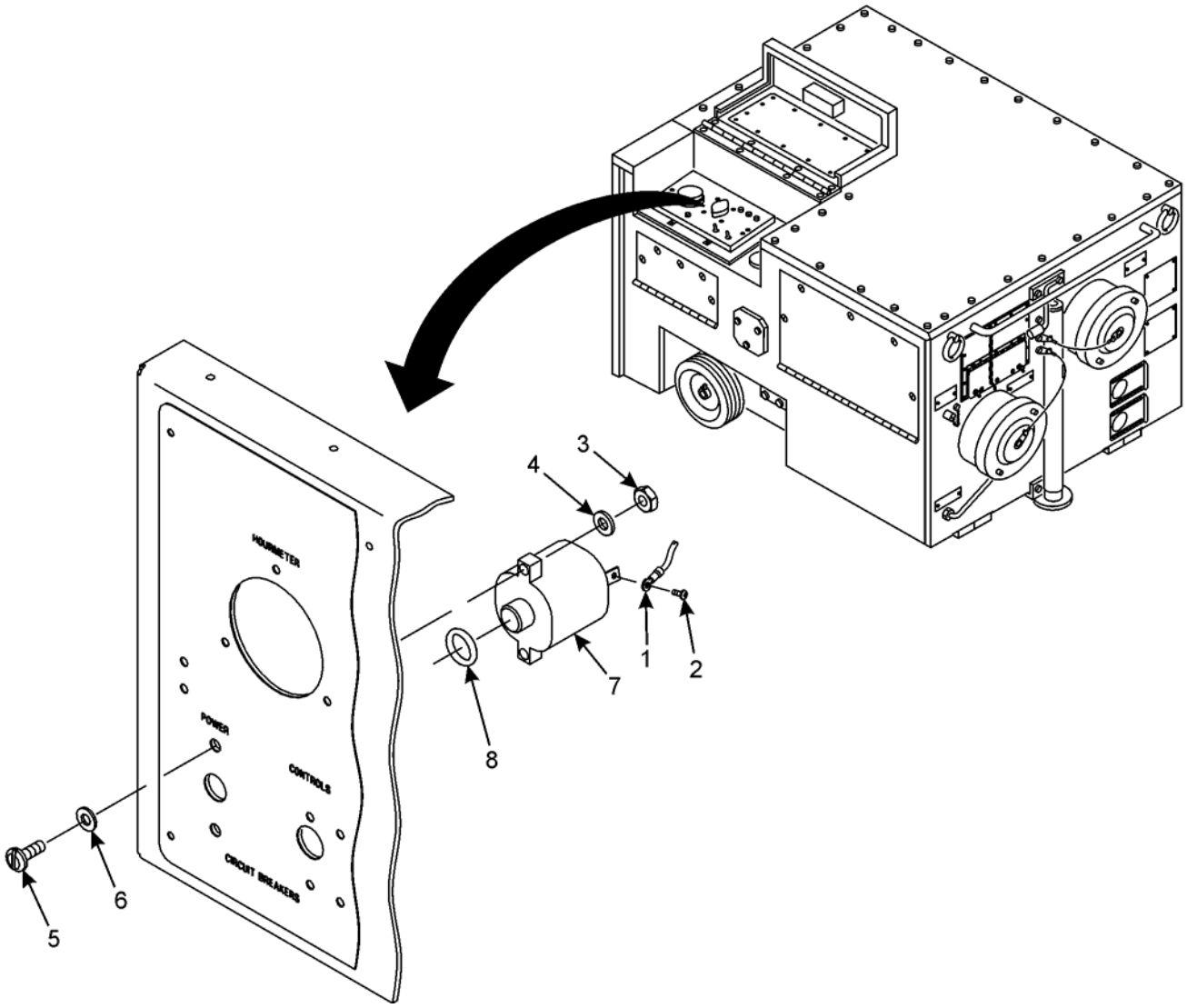
1. Tag two wires (1).
2. Remove two screws (2) and wires (1).
3. Remove three nuts (3), washers (4), screws (5), HOURMETER (6), and gasket (7).



DISASSEMBLY – Continued

POWER CIRCUIT BREAKER CB1 Removal

1. Tag two wires (1).
2. Remove two screws (2) and wires (1).
3. Remove two nuts (3), lockwashers (4), screws (5), preformed packings (6), POWER CIRCUIT BREAKER CB1 (7), and preformed packing (8). Discard lockwashers.

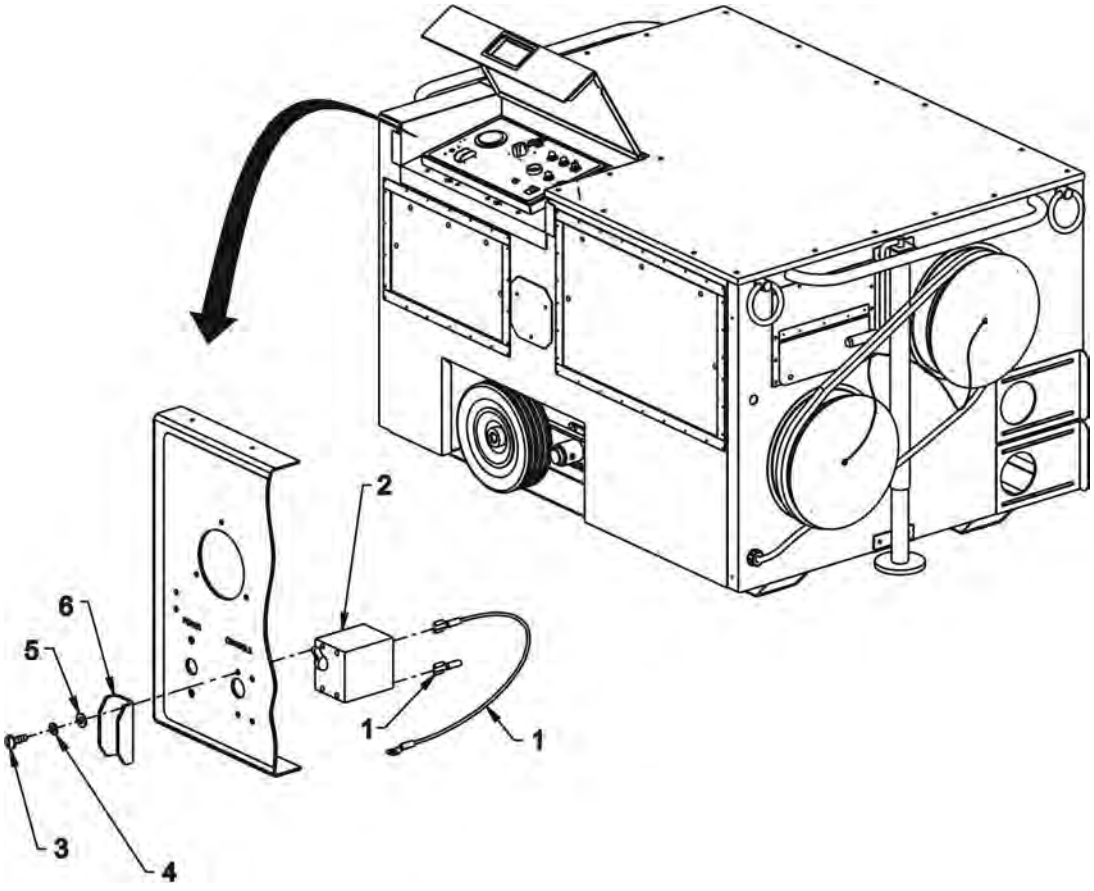


DISASSEMBLY – Continued

CONTROLS CIRCUIT BREAKER CB2 Removal

1. Tag and disconnect four wires (1) from CONTROLS CIRCUIT BREAKER CB2 (2).

2. Remove four screws (3), lockwashers (4), washers (5), guard (6), and CONTROLS CIRCUIT BREAKER CB2 (2). Discard lockwashers.



DISASSEMBLY – Continued

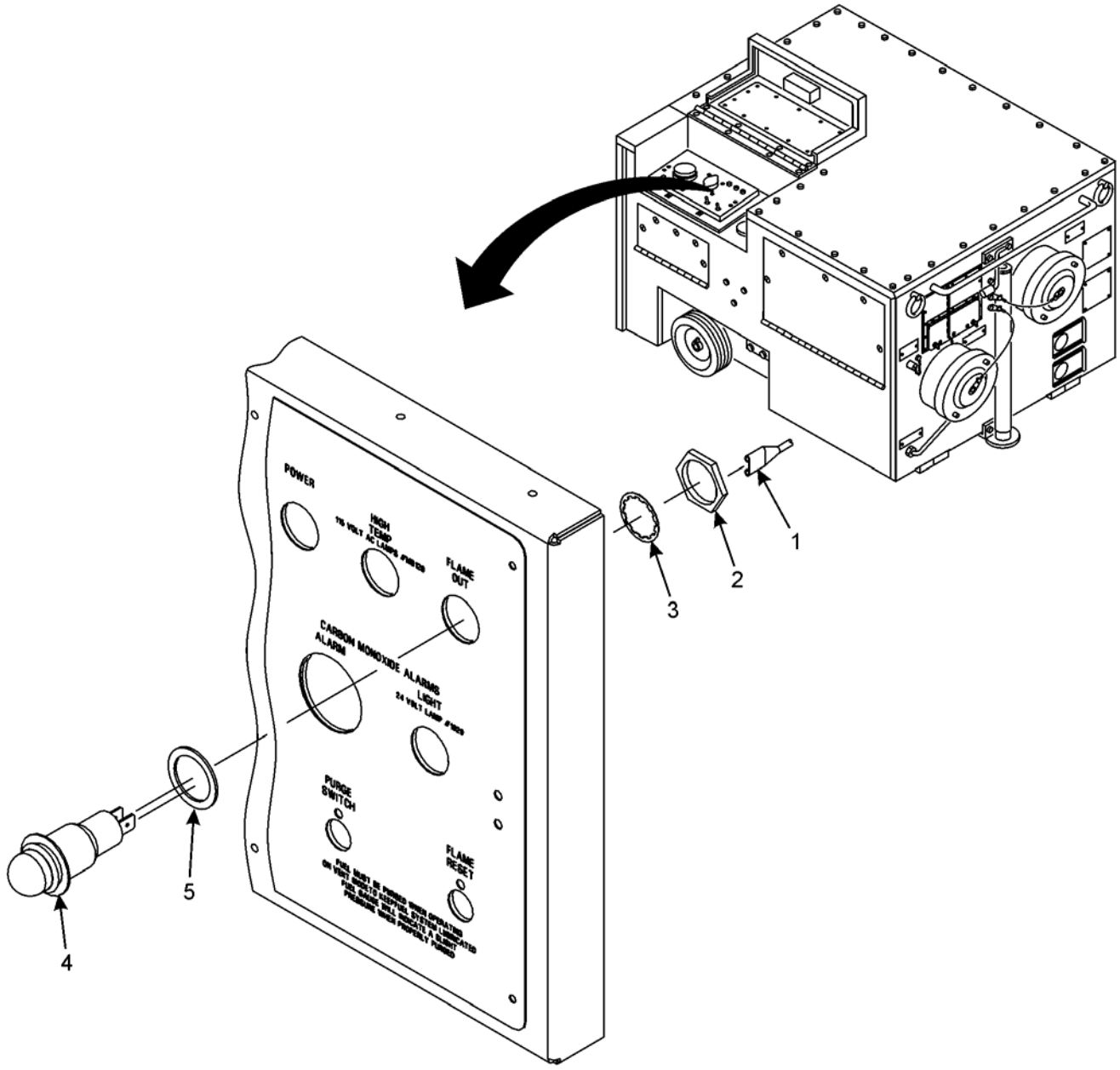
POWER Indicator PS1, HIGH TEMP Indicator DS2, FLAME OUT Indicator DS3, and CARBON MONOXIDE ALARMS LIGHT DS4 Removal

NOTE

Procedures are typical for POWER indicator PS1, HIGH TEMP indicator DS2, FLAME OUT indicator DS3, and CARBON MONOXIDE ALARMS LIGHT DS4. FLAME OUT indicator DS3 is shown.

1. Tag and disconnect two wires (1).

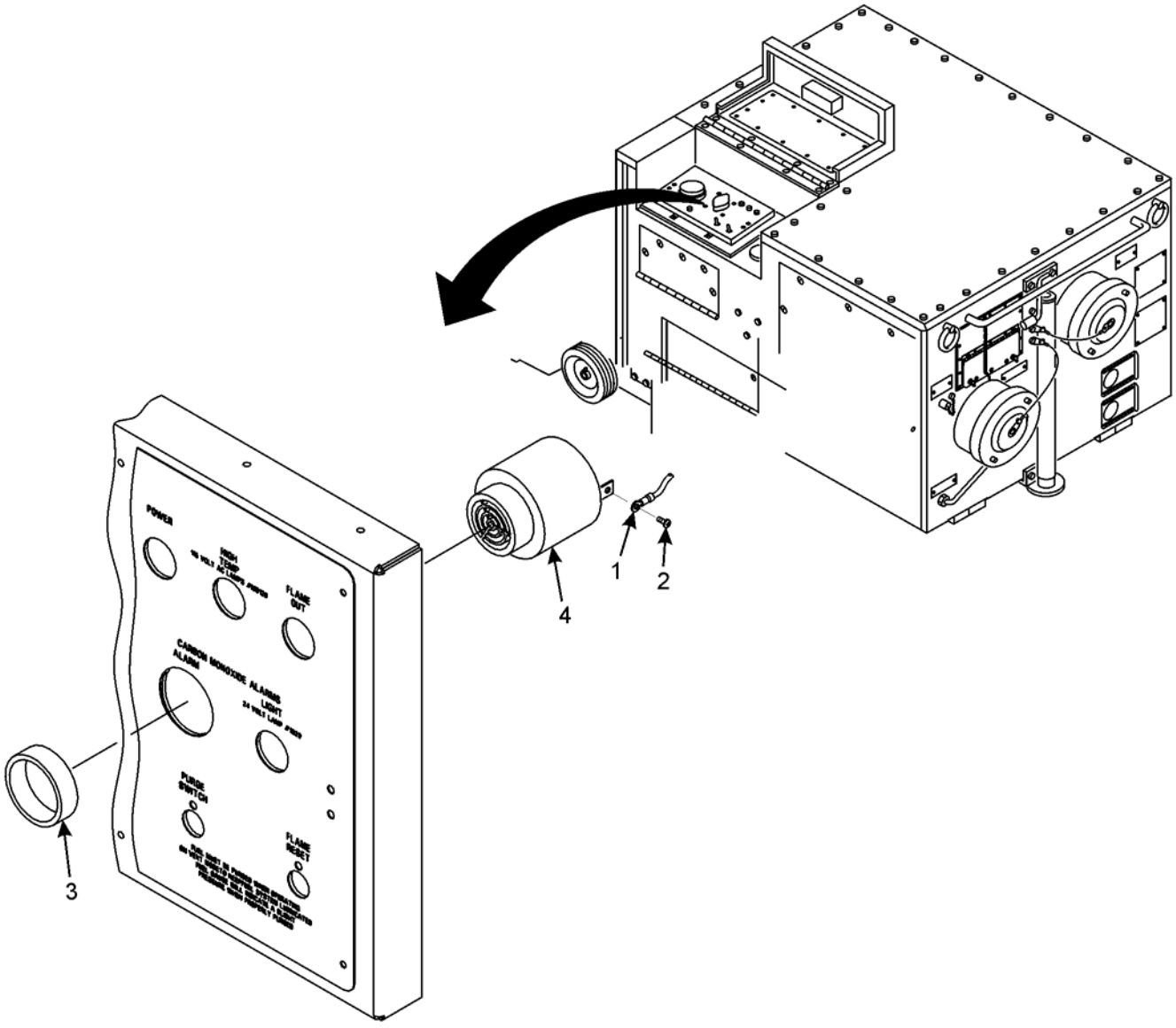
2. Remove nut (2), lockwasher (3), FLAME OUT indicator DS3 (4), and seal (5).



DISASSEMBLY – Continued

CARBON MONOXIDE ALARM Removal

1. Tag two wires (1).
2. Remove two screws (2) and wires (1).
3. Remove mounting ring (3) and CARBON MONOXIDE ALARM (4).



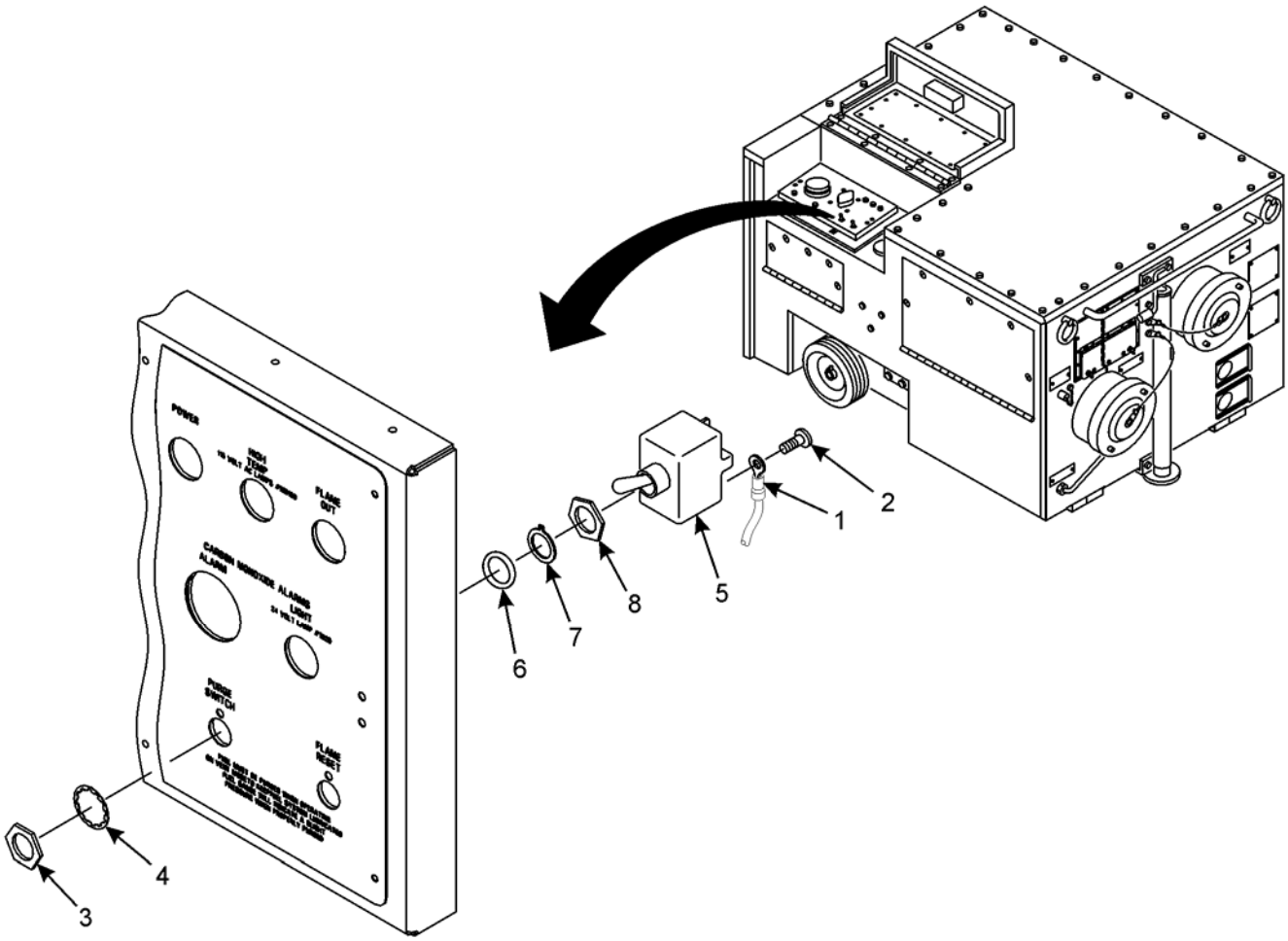
DISASSEMBLY – Continued

PURGE SWITCH S4 and FLAME RESET Switch S7 Removal

NOTE

Procedures are typical for PURGE SWITCH S4 and FLAME RESET switch S7. PURGE SWITCH S4 is shown.

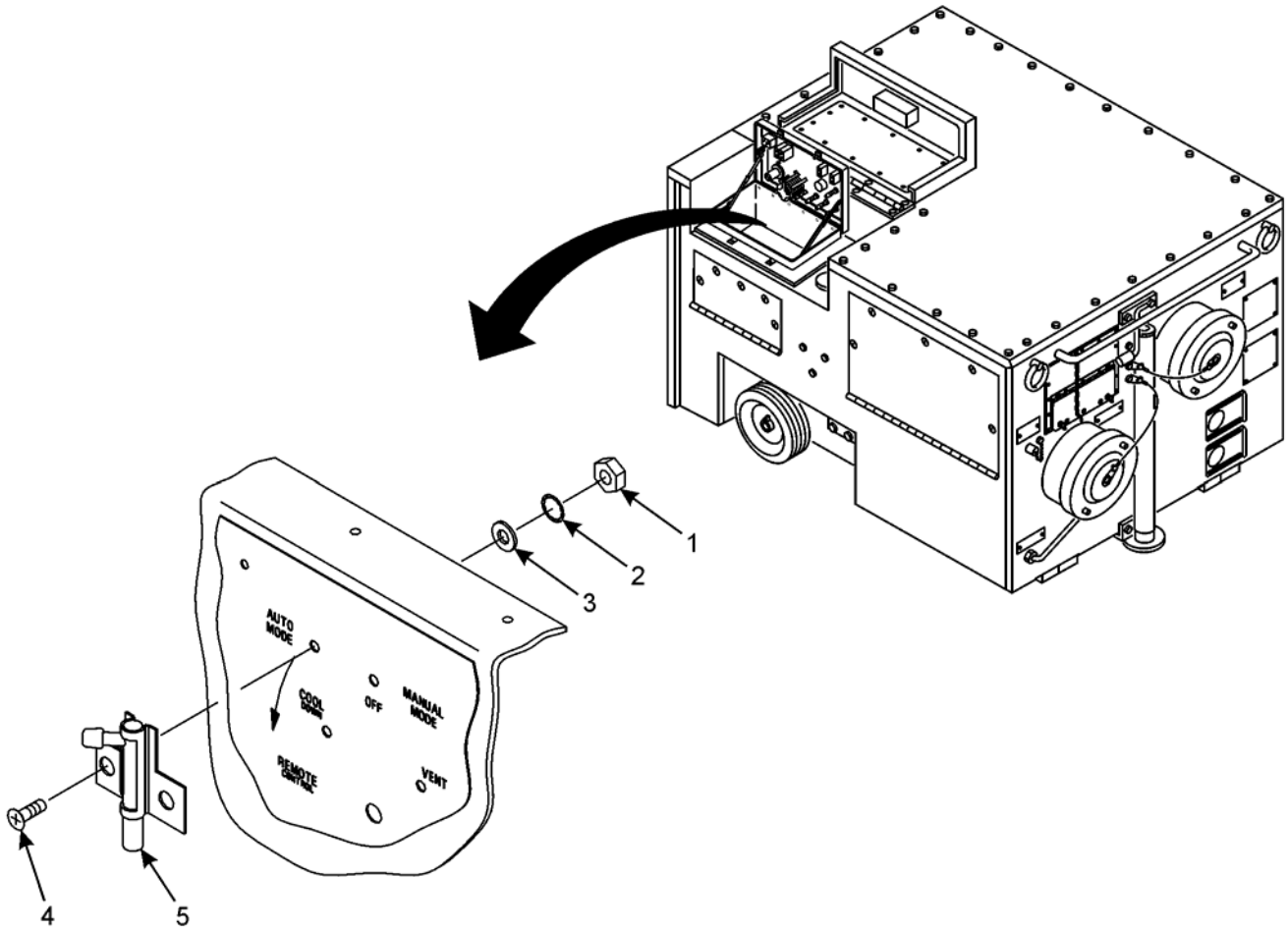
1. Tag two wires (1).
2. Remove two screws (2) and wires (1).
3. Remove nut (3), lockwasher (4), PURGE SWITCH S4 (5), preformed packing (6), key (7), and nut (8).



DISASSEMBLY – Continued

Remote Lockout Removal

Remove two nuts (1), lockwashers (2), washers (3), screws (4), and remote lockout (5). Discard lockwashers.



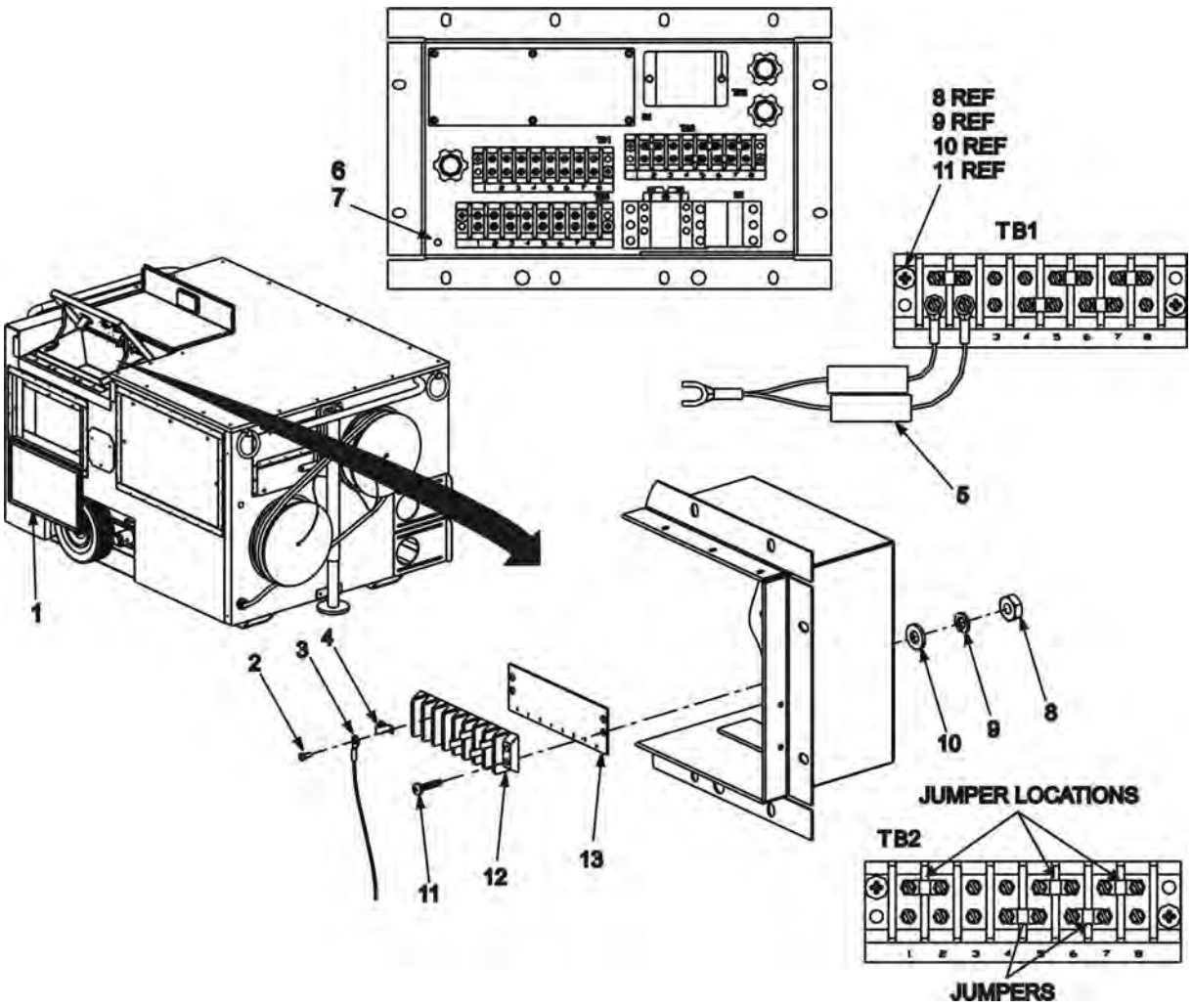
DISASSEMBLY – Continued

Electromagnetic Interference (EMI) Jumper and Terminal Boards TB1, TB2, and TB3 Removal

NOTE

Procedures are typical for terminal boards TB1, TB2, and TB3 except that only terminal board TB1 has an EMI jumper. Terminal board TB2 is shown.

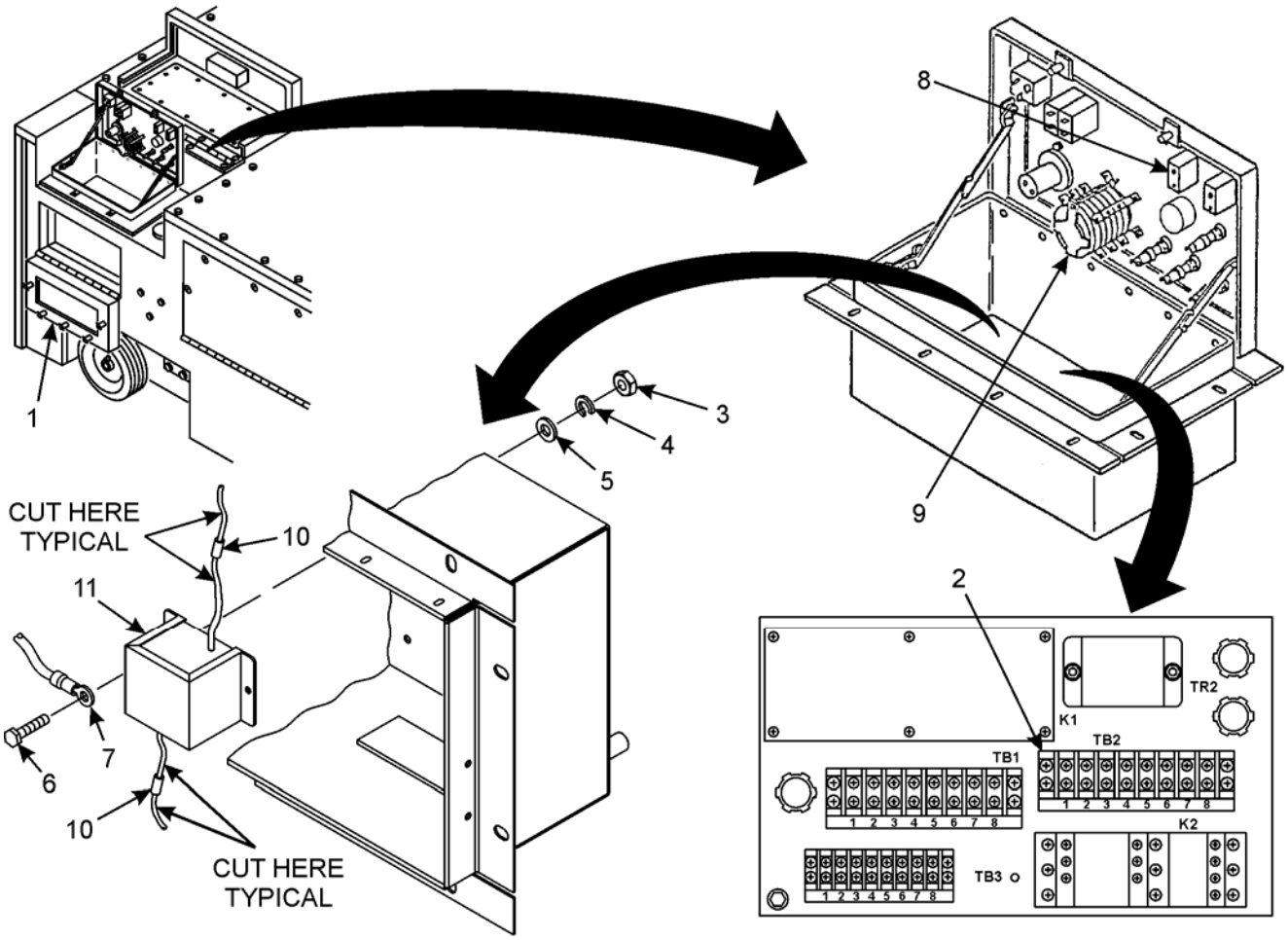
1. Open side rear door (1).
2. Cut wire ties as required and tag all wires (2).
3. Remove screws (3), wires (2), jumpers (4), and two EMI jumper (5) leads (terminal board TB1 only).
4. Loosen two nuts (6), screw (7) and remove EMI jumper (5) (terminal board TB1 only).
5. Remove two nuts (8), lockwashers (9), washers (10), screws (11), terminal board TB2 (12), and marker strip (13). Discard lockwashers.



DISASSEMBLY – Continued

Transformer TR2 Removal

1. Open side rear door (1).
2. Tag and disconnect two transformer TR2 wires from terminal board TB2 (2) terminals 1 and 8.
3. Remove two nuts (3), lockwashers (4), washers (5), screws (6), and ground lugs (7). Discard lockwashers.
4. Tag red transformer TR2 wire connected to CB2-3 (8) and black wire connected to S1-33 (9).
5. Cut two wires and remove two splices (10) and transformer TR2 (11).



DISASSEMBLY – Continued

Combustion Control Relay K1 Removal

1. Open side rear door (1).

2. Tag all wires (2) attached to grounding stud (3). Cut wire ties as required.

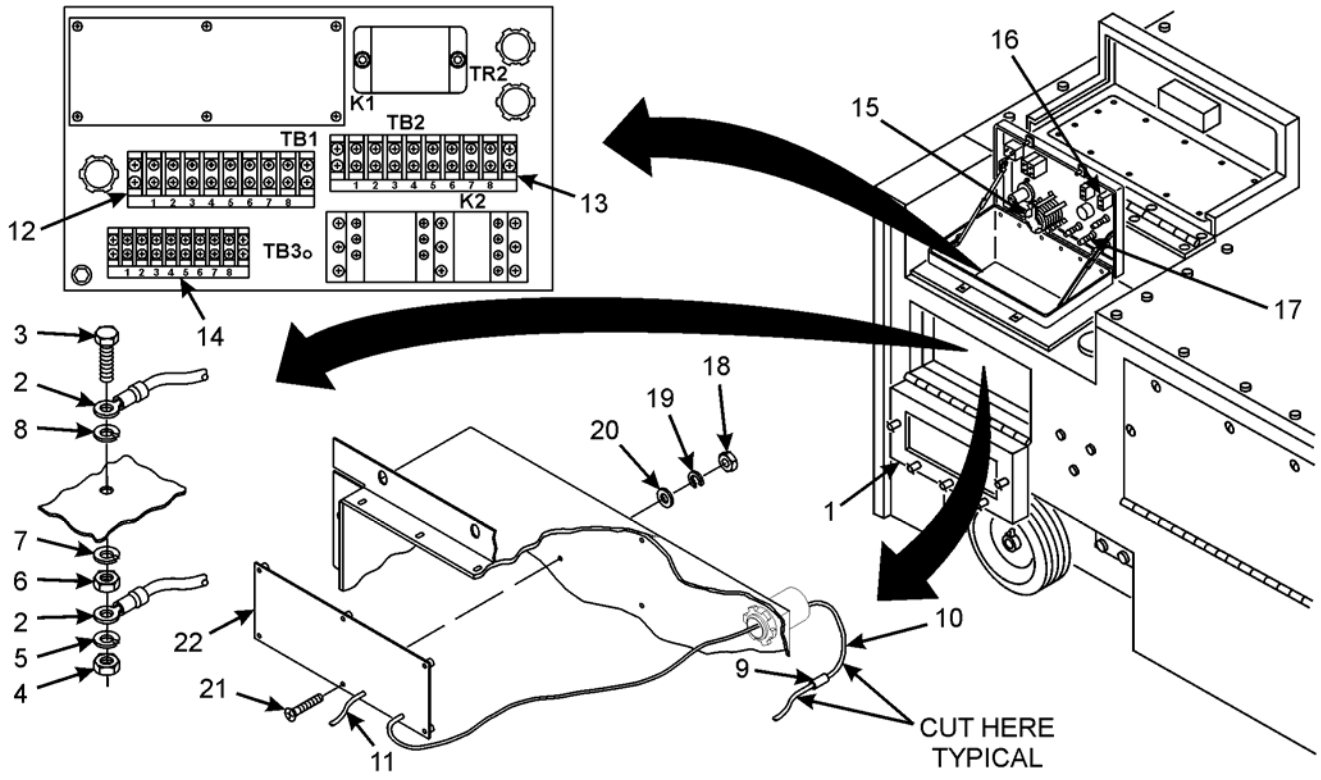
3. Remove nut (4), lockwasher (5), wires (2), nut (6), lockwasher (7), grounding stud (3), wires (2) (GND), and lockwasher (8). Discard lockwashers.

4. Tag and cut splices (9) from carbon monoxide detector wires CO-1 thru CO-3 (10).

5. Tag and disconnect wires (11) from the following:

   TB1-4 thru TB1-7 (12)
   TB2-1 and -8 (13)
   TB3-1 thru TB3-6 (14)
   S1-27 and -47 (15), S7-2 (16), and DS3 (17)

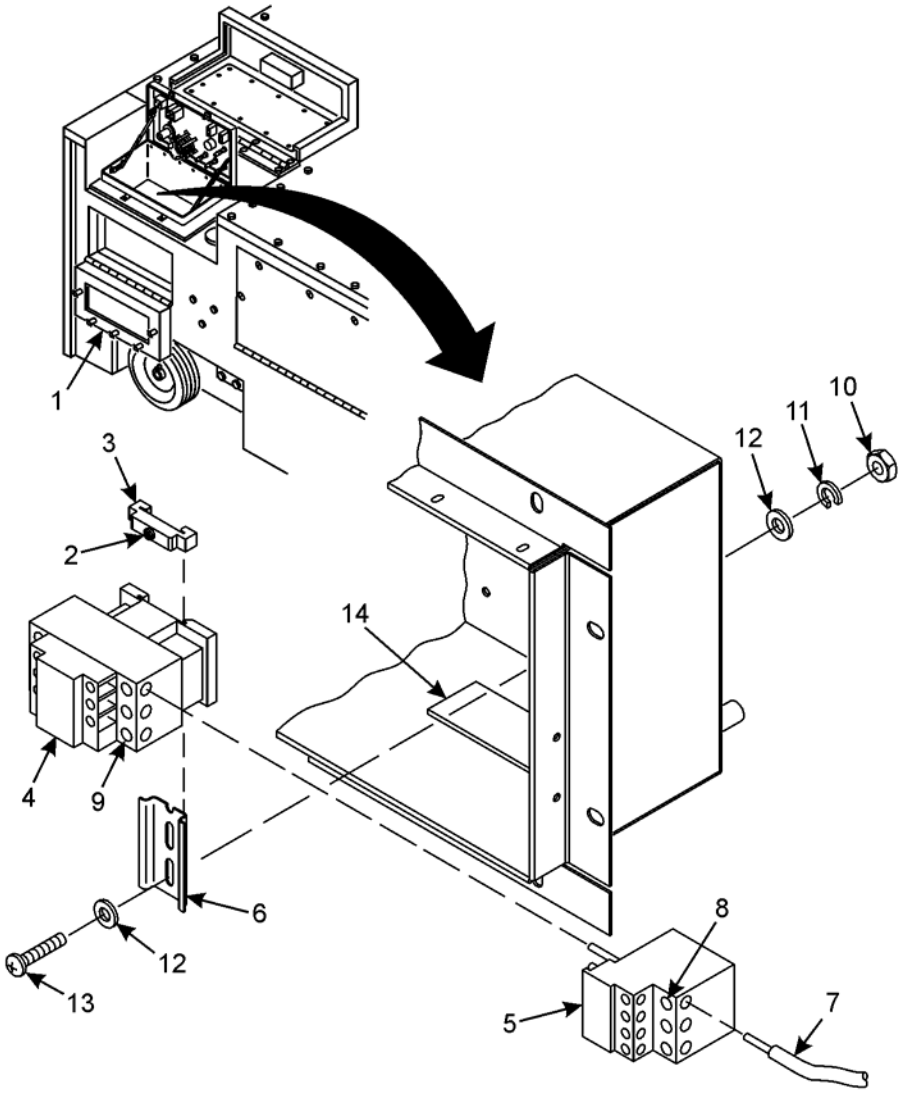
6. Remove six nuts (18), lockwasher (19), washers (20), screws (21), and combustion control relay K1 (22). Discard lockwashers.



DISASSEMBLY – Continued

Motor Contactor and Motor Overload Protector Removal

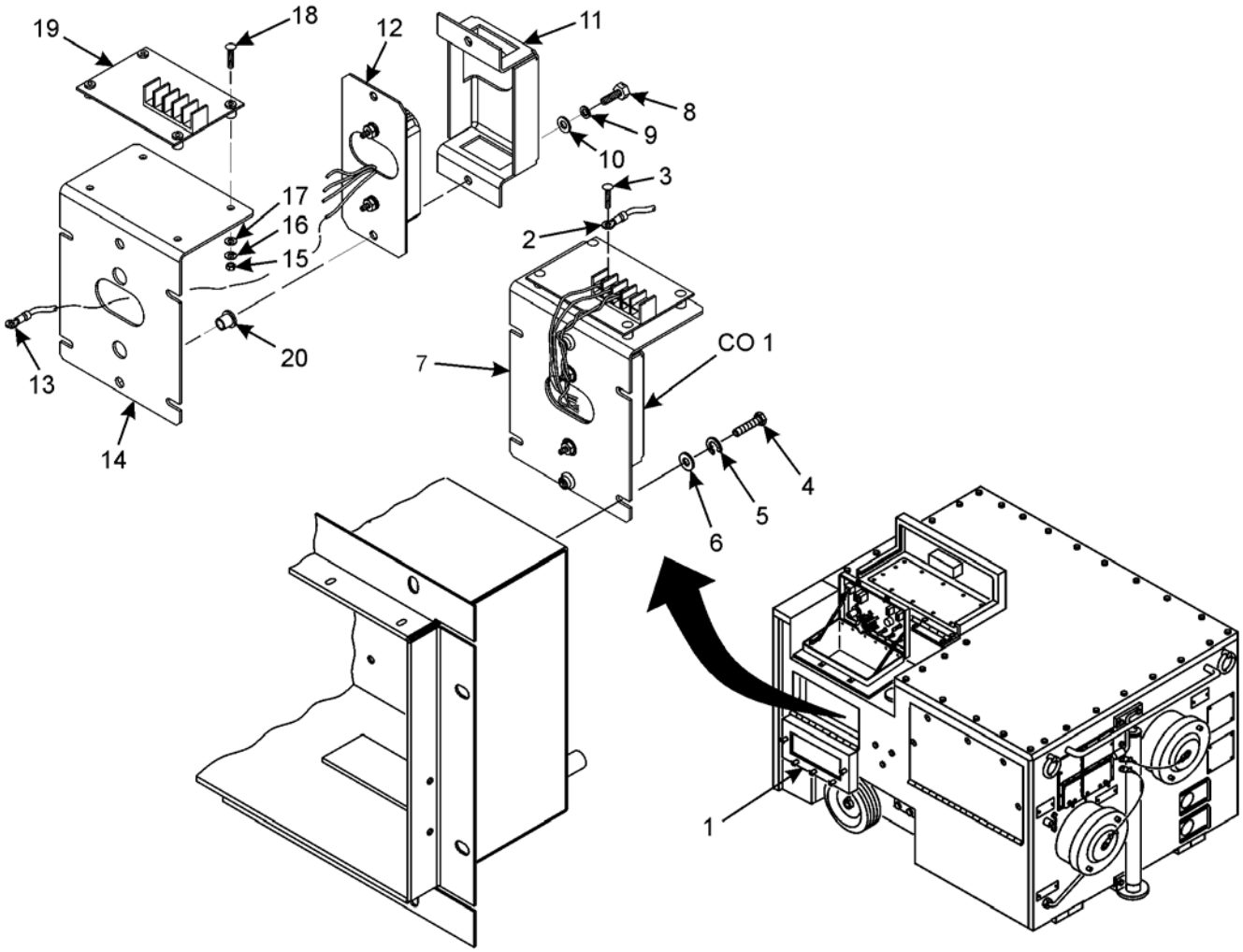
1. Open side rear door (1).
2. Loosen setscrew (2) and slide clamp (3), motor contactor (4), and motor overload protector (5) from mounting plate (6).
3. Tag ten wires (7).
4. Loosen ten setscrews (8) and disconnect wires (7) from motor contactor (4) and motor overload protector (5).
5. Loosen three setscrews (9) and separate motor overload protector (5) from motor contactor (4).
6. Remove two nuts (10), lockwashers (11), four washers (12), two screws (13), and mounting plate (6). Discard lockwashers.
7. Remove gasket (14).



DISASSEMBLY – Continued

Carbon Monoxide Detector CO1 Assembly Removal

1. Open side rear door (1).
2. Tag wires CO-1 thru CO-5 (2) and remove screws (3) and wires (2).
3. Remove four screws (4), lockwashers (5), washers (6), and carbon monoxide detector CO1 assembly (7). Discard lockwashers.
4. Remove two screws (8), lockwashers (9), washers (10), and cover (11). Discard lockwashers.
5. Remove carbon monoxide detector CO1 (12) and tag and carefully guide wires (13) from bracket (14).
6. Remove four nuts (15), lockwashers (16), washers (17), screws (18), and relay board (19). Discard lockwashers.
7. Drill out rivnuts (20) as required.



INSPECTION

1. Inspect all parts for wear, cracks, corrosion, bent or broken terminals, and broken/cracked glass.

2. Inspect all hardware for stripped or damaged threads.

REPAIR

Repair is limited to replacement of defective parts.

ASSEMBLY

Carbon Monoxide Detector CO1 Assembly Installation

1. Install rivnuts (20) as required.

2. Install relay board (19), four screws (18), washers (17), lockwashers (16) (item 31, WP 0062 00), and nuts (15).

3. Carefully guide wires (13) through bracket (14) and position carbon monoxide detector CO1 (12).

4. Install carbon monoxide detector CO1 (12), cover (11), two washers (10), lockwashers (9) (item 27, WP 0062 00), and screws (8).

5. Install carbon monoxide detector CO1 assembly (7), four washers (6), lockwashers (5) (item 27, WP 0062 00), and screws (4).

6. Install following wires (13). Remove wire marker tags.

   White wire (either white wire) to terminal CO-1
   Red wire to terminal CO-2
   Remaining white wire and black wire to terminal CO-3

7. Using screws (3), install following five wires (2). Remove wire marker tags.

   CO-1 to relay board terminal CO-1
   CO-2 to terminal CO-2
   CO-3 to terminal CO-3
   CO-4 to terminal CO-4
   CO-5 to terminal CO-5

8. Close side rear door (1).

ASSEMBLY – Continued

Motor Contactor and Motor Overload Protector Installation

1. Install gasket (14).

2. Install mounting plate (6) with two screws (13), four washers (12), two lockwashers (11) (item 27, WP 0062 00), and nuts (10).

3. Install motor overload protector (5) onto motor contactor (4) and tighten three setscrews (9).

4. Connect following ten wires (7) and tighten setscrews (8). Remove wire marker tags.

   K2-1↔TB1-2 to K2-1
   K2-3↔TB1-3 to K2-3
   K2-5↔K2-4 to K2-5
   K2-5↔K2-4 to K2-4
   K2-2↔B1-T4, T8 to K2-2
   K2-6↔B1-T1, T5 to K2-6
   K2-13↔TB1-3 to K2-13
   K2-14↔DS1 to K2-14
   K2-A1↔TB1-4 to K2-A1
   K2-A2↔TB2-4 to K2-A2

5. Slide motor contactor (4) and motor overload protector (5) onto mounting plate (6).

6. Install clamp (3) and tighten setscrew (2).

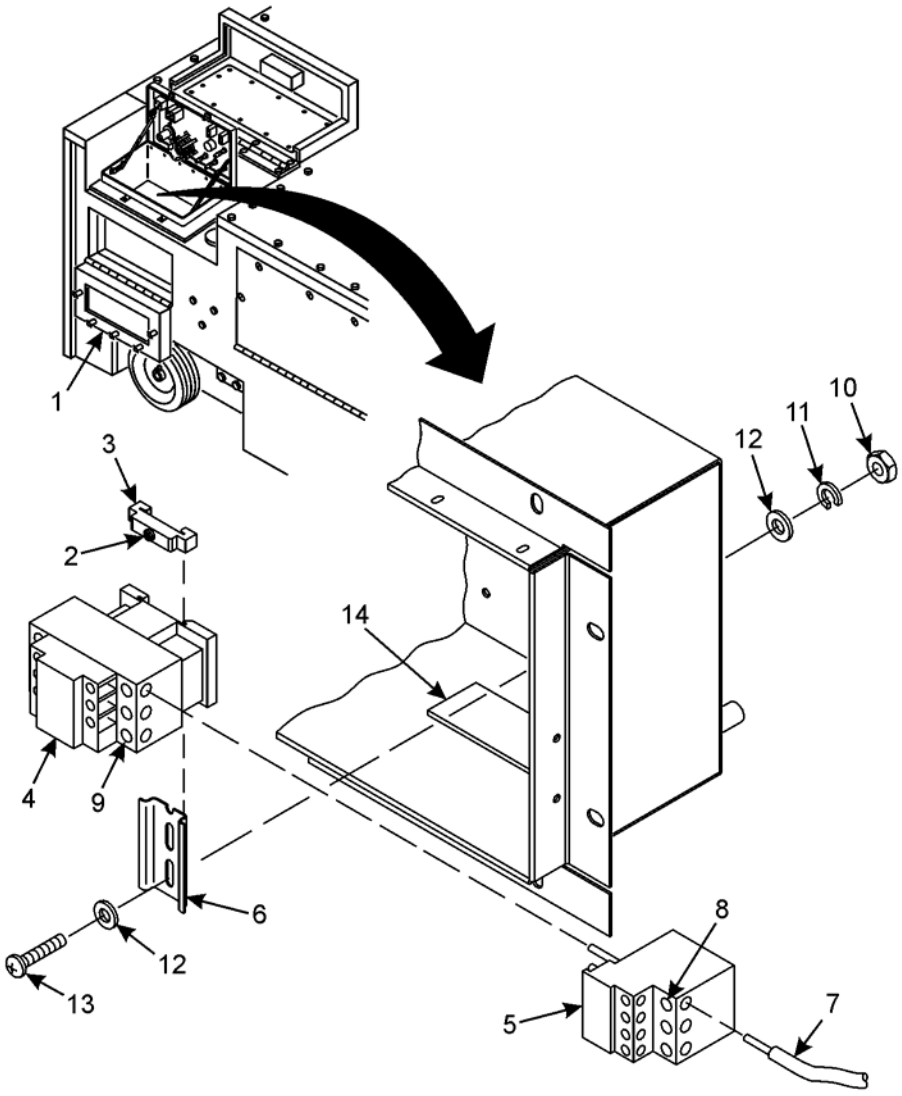
WARNING

Acrylic lacquer sealant is flammable. Keep away from open flames or other sources of ignition. Avoid breathing fumes from sealant. Good general ventilation is normally adequate. Avoid skin contact with sealant.

7. Apply light coat of acrylic lacquer sealer to electrical connections.

8. Close side rear door (1).

ASSEMBLY – Continued



ASSEMBLY – Continued

Combustion Control Relay K1 Installation

1. Install combustion control relay K1 (22), six screws (21), washers (20), lockwashers (19) (item 20, WP 0062 00), and nuts (18).

2. Connect wires (11) to the following. Remove wire marker tags.

   DS3 (17), S7-2 (16), and S1-27 and -47 (15)
   TB3-6 thru TB3-1 (14)
   TB2-8 and -1 (13)
   TB1-7 thru TB1-4 (12)

3. Install splices (9) onto wires CO-3 thru CO-1 (10). Remove wire marker tags.

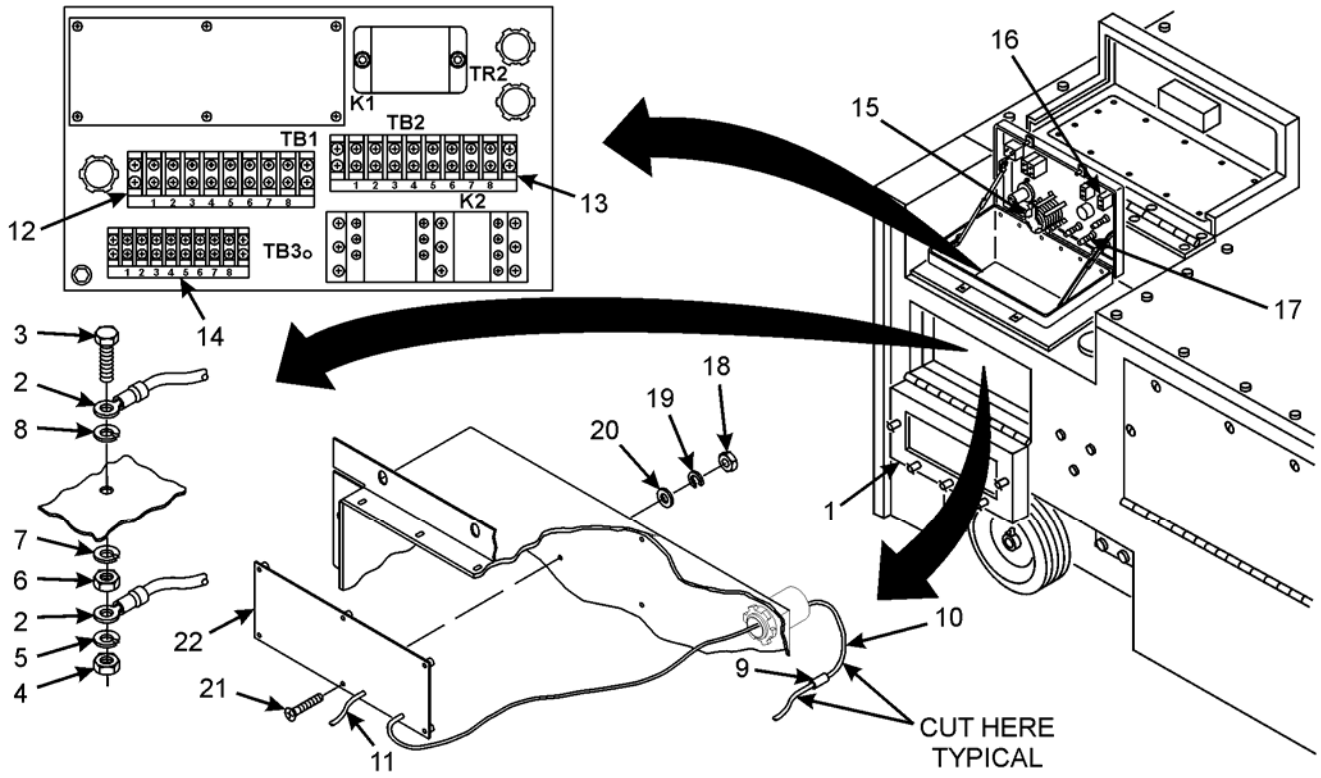
4. Install lockwasher (8) (item 23, WP 0062 00), wires (2) (GND), grounding stud (3), lockwasher (7) (item 23, WP 0062 00), nut (6), wires (2), lockwasher (5) (item 23, WP 0062 00), and nut (4).

WARNING

Acrylic lacquer sealant is flammable. Keep away from open flames or other sources of ignition. Avoid breathing fumes from sealant. Good general ventilation is normally adequate. Avoid skin contact with sealant.

5. Apply light coat of acrylic lacquer sealer to grounding stud (3) connections.

6. Close side rear door (1).



ASSEMBLY – Continued

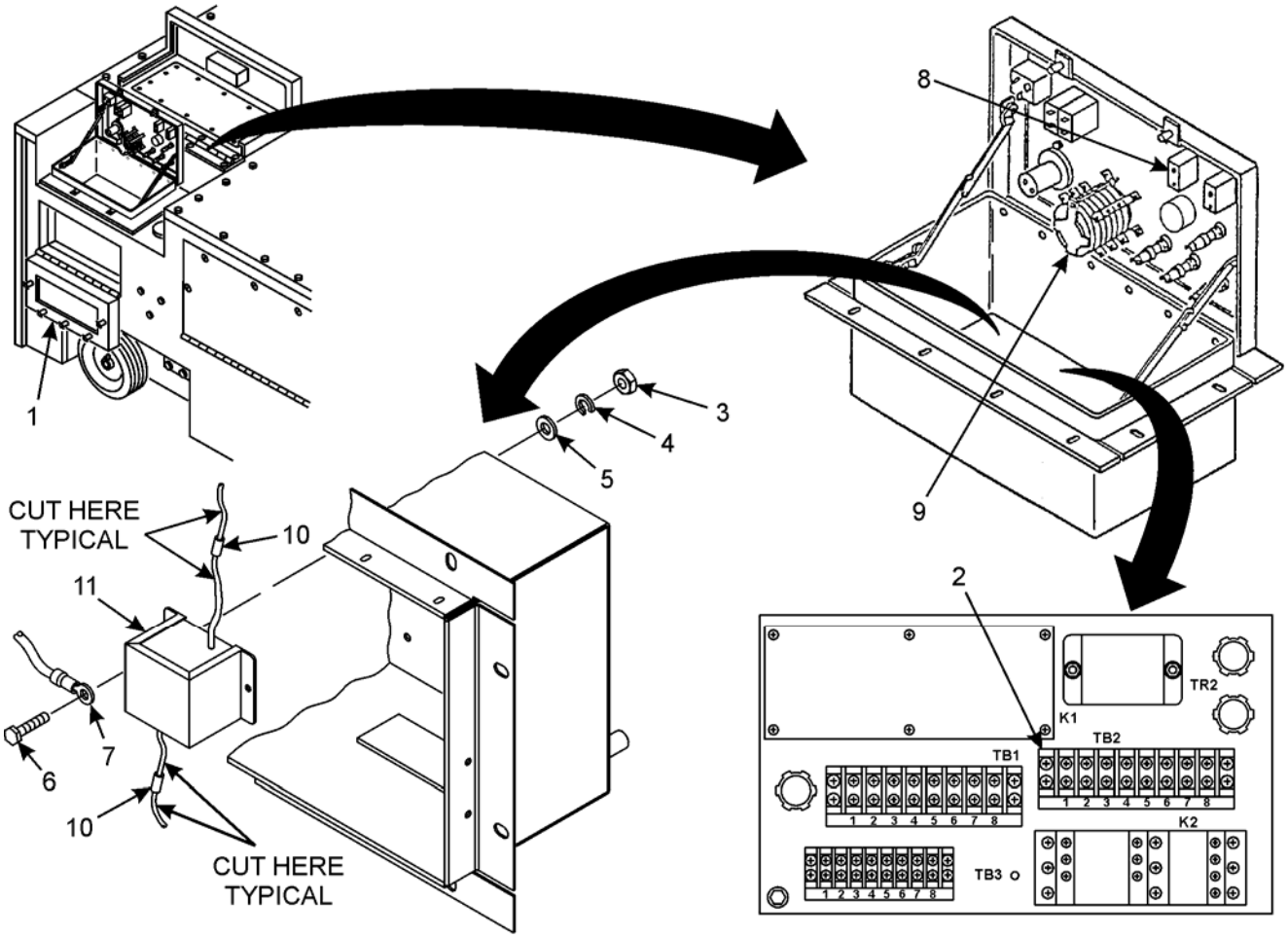
Transformer TR2 Installation

1. Place transformer TR2 (11) into position.
2. Install two splices (10) onto wires from S1-33 (9) and CB2-3 (8). Remove wire marker tags.
3. Install two ground lugs (7), screws (6), washers (5), lockwashers (4) (item 27, WP 0062 00), and nuts (3).
4. Connect two transformer TR2 wires to terminal board TB2 (2) terminals 8 and 1. Remove wire marker tags.

WARNING

Acrylic lacquer sealant is flammable. Keep away from open flames or other sources of ignition. Avoid breathing fumes from sealant. Good general ventilation is normally adequate. Avoid skin contact with sealant.

5. Apply light coat of acrylic lacquer sealer to transformer TR2 (10) connections.
6. Close side rear door (1).



ASSEMBLY – Continued

EMI Jumper and Terminal Boards TB1, TB2, and TB3 Installation

NOTE

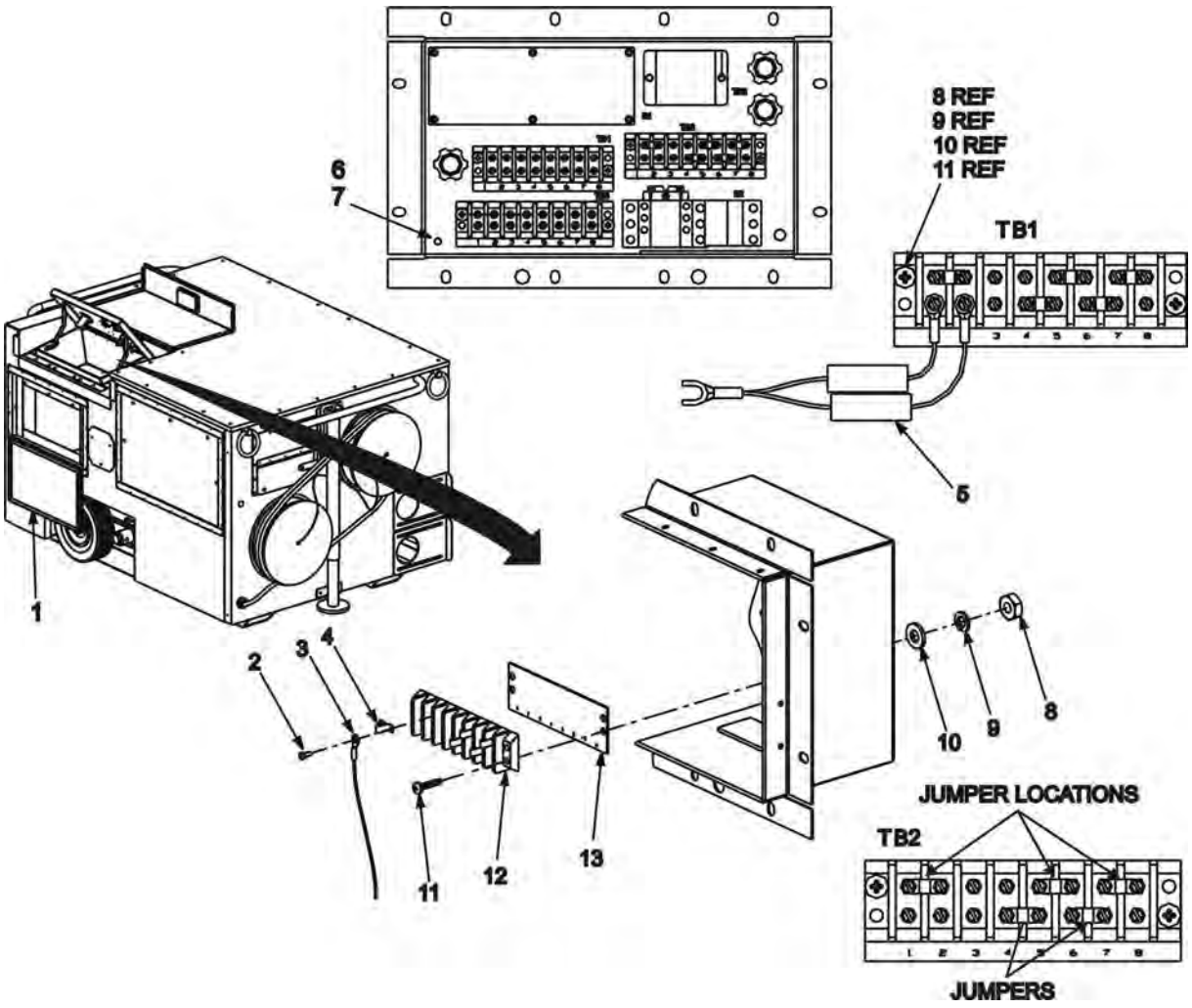
Procedures are typical for terminal boards TB1, TB2, and TB3 except that only terminal board TB1 has an EMI jumper. Terminal board TB2 is shown.

1. Install marker strip (13), terminal board TB2 (12), two screws (11), washers (10), lockwashers (9) (item 27, WP 0062 00), and nuts (8).
2. Install two EMI jumper (5) leads (terminal board TB1 only), jumpers (4), wires (2), and screws (3). Install wires ties as required. Remove wire marker tags.
3. Install EMI jumper (5) lead (terminal board TB1 only) under screw (7) and tighten two nuts (6).

WARNING

Acrylic lacquer sealant is flammable. Keep away from open flames or other sources of ignition. Avoid breathing fumes from sealant. Good general ventilation is normally adequate. Avoid skin contact with sealant.

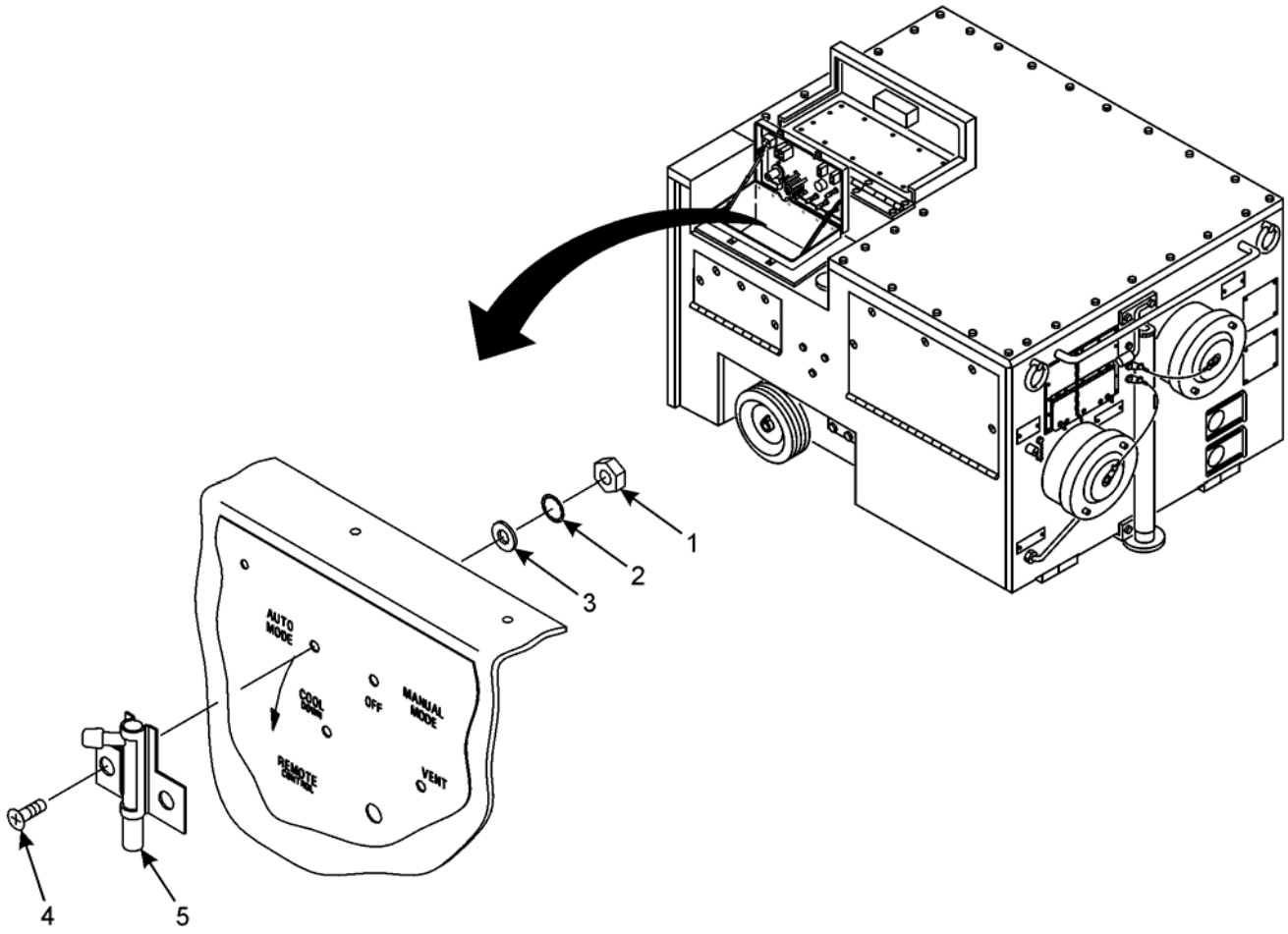
4. Apply light coat of acrylic lacquer sealer to terminal board TB2 (12) terminals.
5. Close side rear door (1).



ASSEMBLY – Continued

Remote Lockout Installation

Place remote lockout (5) into position and secure with two screws (4), washers (3), lockwashers (2) (item 20, WP 0062 00), and nuts (1).



ASSEMBLY – Continued

PURGE SWITCH S4 and FLAME RESET Switch S7 Installation

NOTE

Procedures are typical for PURGE SWITCH S4 and FLAME RESET switch S7. PURGE SWITCH S4 is shown.

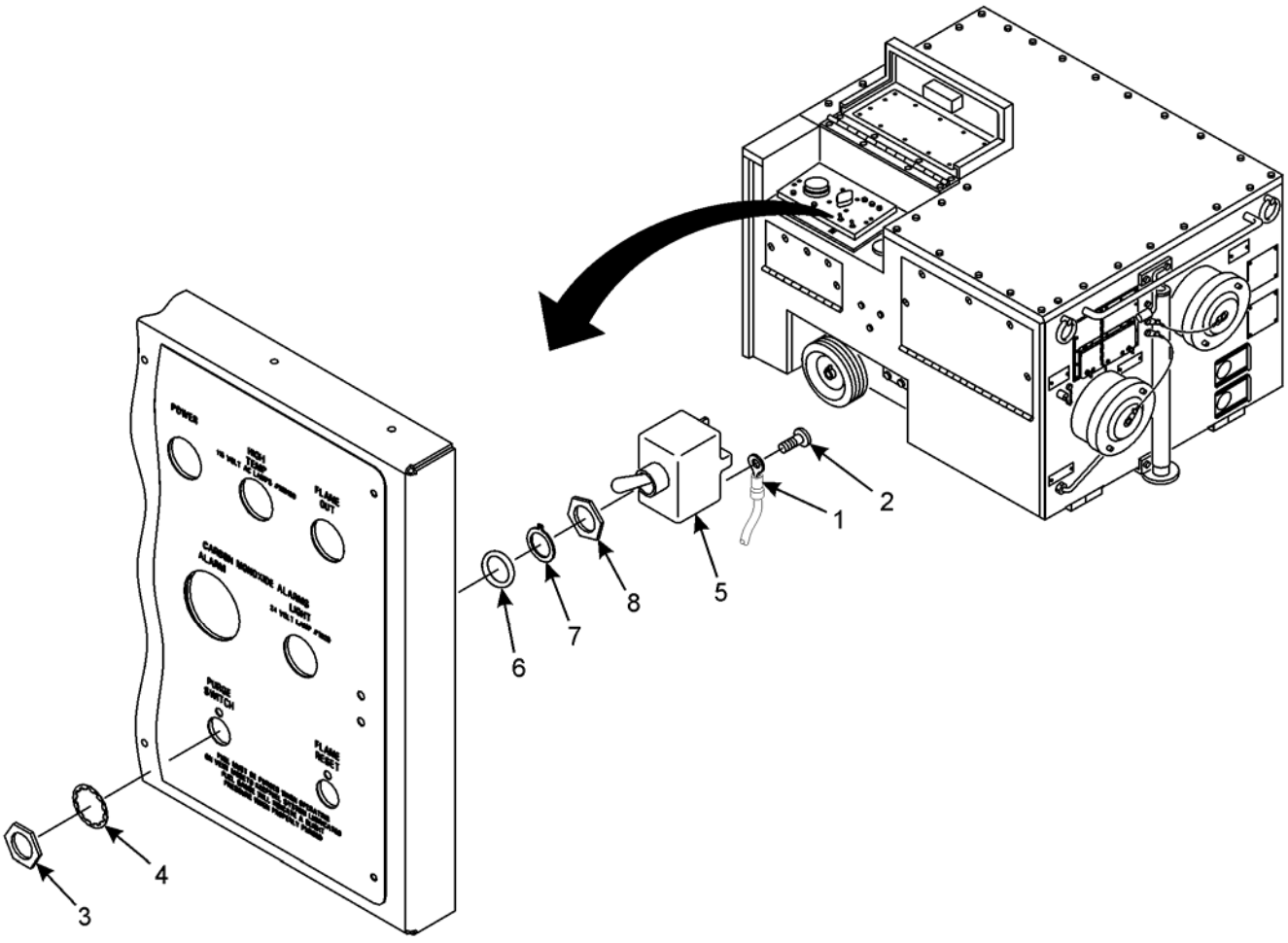
1. Install nut (8), key (7), preformed packing (6), PURGE SWITCH S4 (5), lockwasher (4), and nut (3).

2. Connect two wires (1) with screws (2). Remove wire marker tags.

WARNING

Acrylic lacquer sealant is flammable. Keep away from open flames or other sources of ignition. Avoid breathing fumes from sealant. Good general ventilation is normally adequate. Avoid skin contact with sealant.

3. Apply light coat of acrylic lacquer sealer to PURGE SWITCH S4 (5) terminals.



ASSEMBLY – Continued

CARBON MONOXIDE ALARM Installation

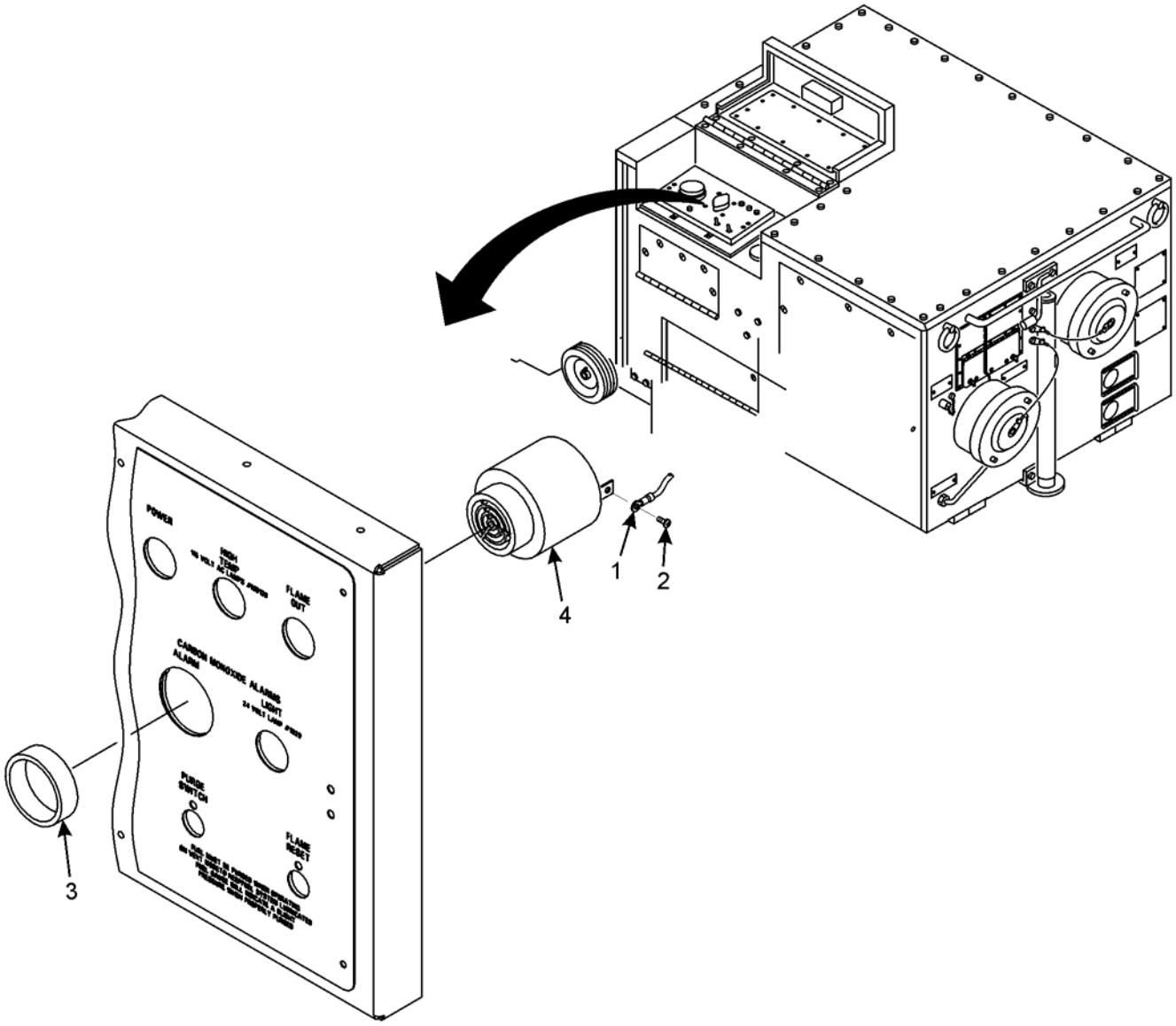
1. Install CARBON MONOXIDE ALARM (4) and mounting ring (3).

2. Connect two wires (1) with screws (2). Remove wire marker tags.

WARNING

Acrylic lacquer sealant is flammable. Keep away from open flames or other sources of ignition. Avoid breathing fumes from sealant. Good general ventilation is normally adequate. Avoid skin contact with sealant.

3. Apply light coat of acrylic lacquer sealer to carbon monoxide detector (4) terminals.



ASSEMBLY – Continued

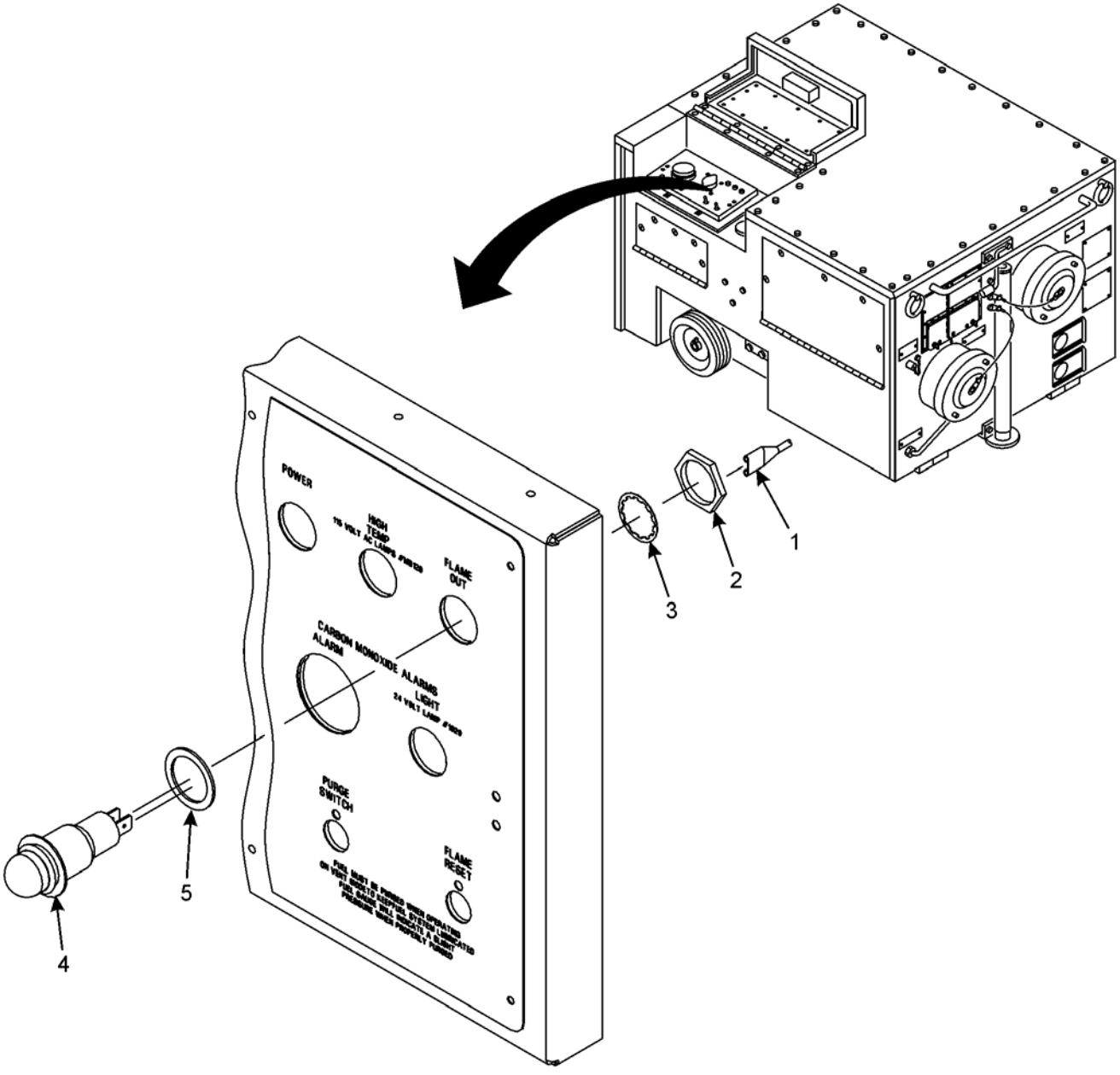
POWER Indicator PS1, HIGH TEMP Indicator DS2, FLAME OUT Indicator DS3, and CARBON MONOXIDE ALARMS LIGHT DS4 Installation

NOTE

Procedures are typical for POWER indicator PS1, HIGH TEMP indicator DS2, FLAME OUT indicator DS3, and CARBON MONOXIDE ALARMS LIGHT DS4. FLAME OUT DS3 indicator is shown.

1. Install seal (5), FLAME OUT indicator DS3 (4), lockwasher (3), and nut (2).

2. Connect two wires (1). Remove wire marker tags.

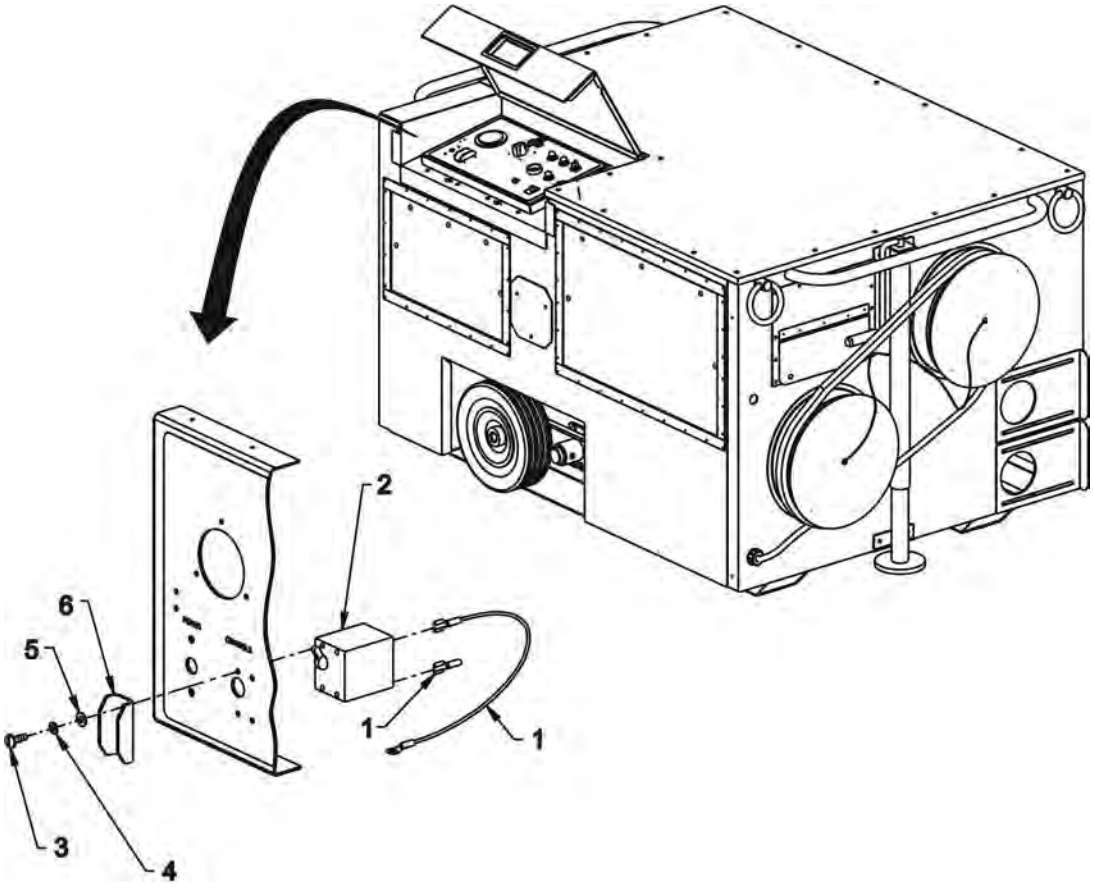


ASSEMBLY – Continued

CONTROLS CIRCUIT BREAKER CB2 Installation

1. Install CONTROLS CIRCUIT BREAKER CB2 (2), guard (6), four washers (5), lockwashers (4) (item 20, WP 0062 00), and screws (3).

2. Connect four wires (1) to CONTROLS CIRCUIT BREAKER CB2 (2). Remove wire marker tags.



ASSEMBLY – Continued

POWER CIRCUIT BREAKER CB1 Installation

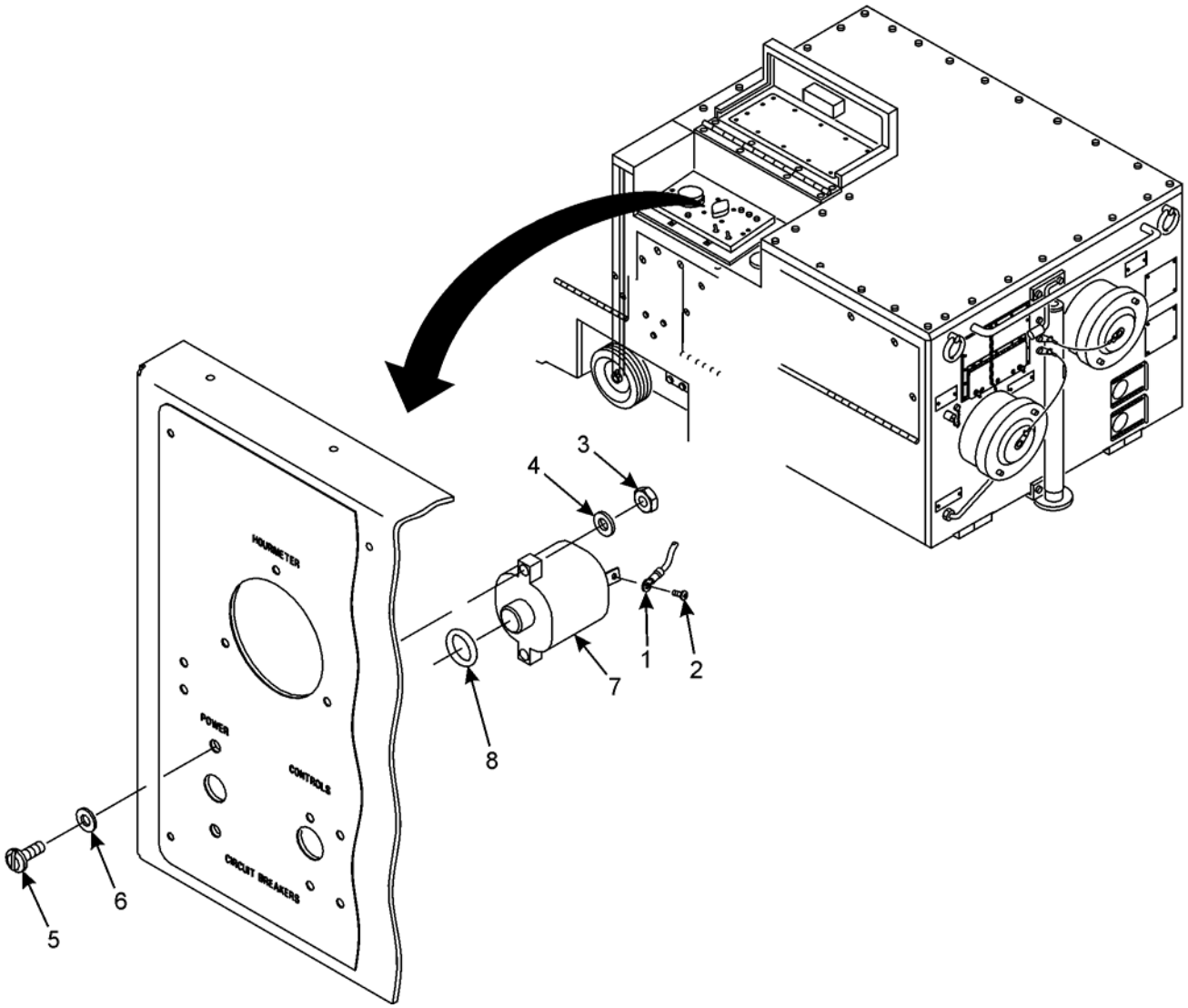
1. Install preformed packing (8), POWER CIRCUIT BREAKER CB1 (7), two preformed packings (6), screws (5), lockwashers (4) (item 22, WP 0062 00), and nuts (3).

2. Connect two wires (1) with screws (2). Remove wire marker tags.

WARNING

Acrylic lacquer sealant is flammable. Keep away from open flames or other sources of ignition. Avoid breathing fumes from sealant. Good general ventilation is normally adequate. Avoid skin contact with sealant.

3. Apply light coat of acrylic lacquer sealer to POWER CIRCUIT BREAKER CB1 (7) terminals.



ASSEMBLY – Continued

HOURMETER Installation

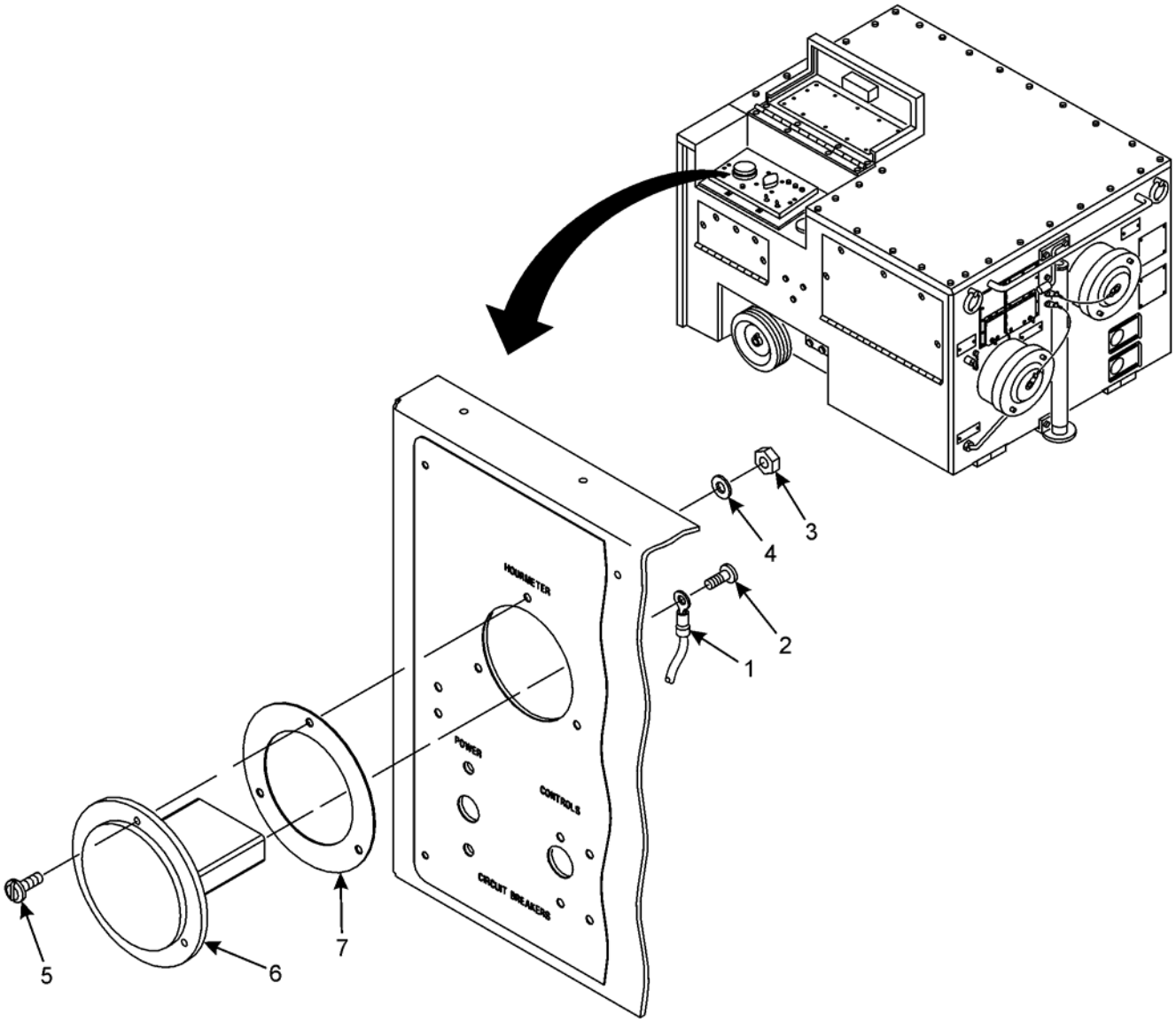
1. Install gasket (7), HOURMETER (6), three screws (5), washers (4), and nuts (3).

2. Connect two wires (1) with screws (2). Remove wire marker tags.

WARNING

Acrylic lacquer sealant is flammable. Keep away from open flames or other sources of ignition. Avoid breathing fumes from sealant. Good general ventilation is normally adequate. Avoid skin contact with sealant.

3. Apply a light coat of acrylic lacquer sealer to HOURMETER (6) terminals.



ASSEMBLY – Continued

MODE SWITCH S1 Installation

1. Install jumpers (8) and all wires (6) with screws (7). Remove wire marker tags.

2. Jumper locations are as follows:

   Between S1-12 and S1-13
   Between S1-13 and S1-14
   Between S1-17 and S1-18
   Between S1-22 and S1-23
   Between S1-23 and S1-24
   Between S1-21 and S1-31 (deck-to-deck)
   Between S1-33 and S1-34
   Between S1-13 and S1-14
   Between S1-53 and S1-54
   Between S1-57 and S1-58

WARNING

Acrylic lacquer sealant is flammable. Keep away from open flames or other sources of ignition. Avoid breathing fumes from sealant. Good general ventilation is normally adequate. Avoid skin contact with sealant.

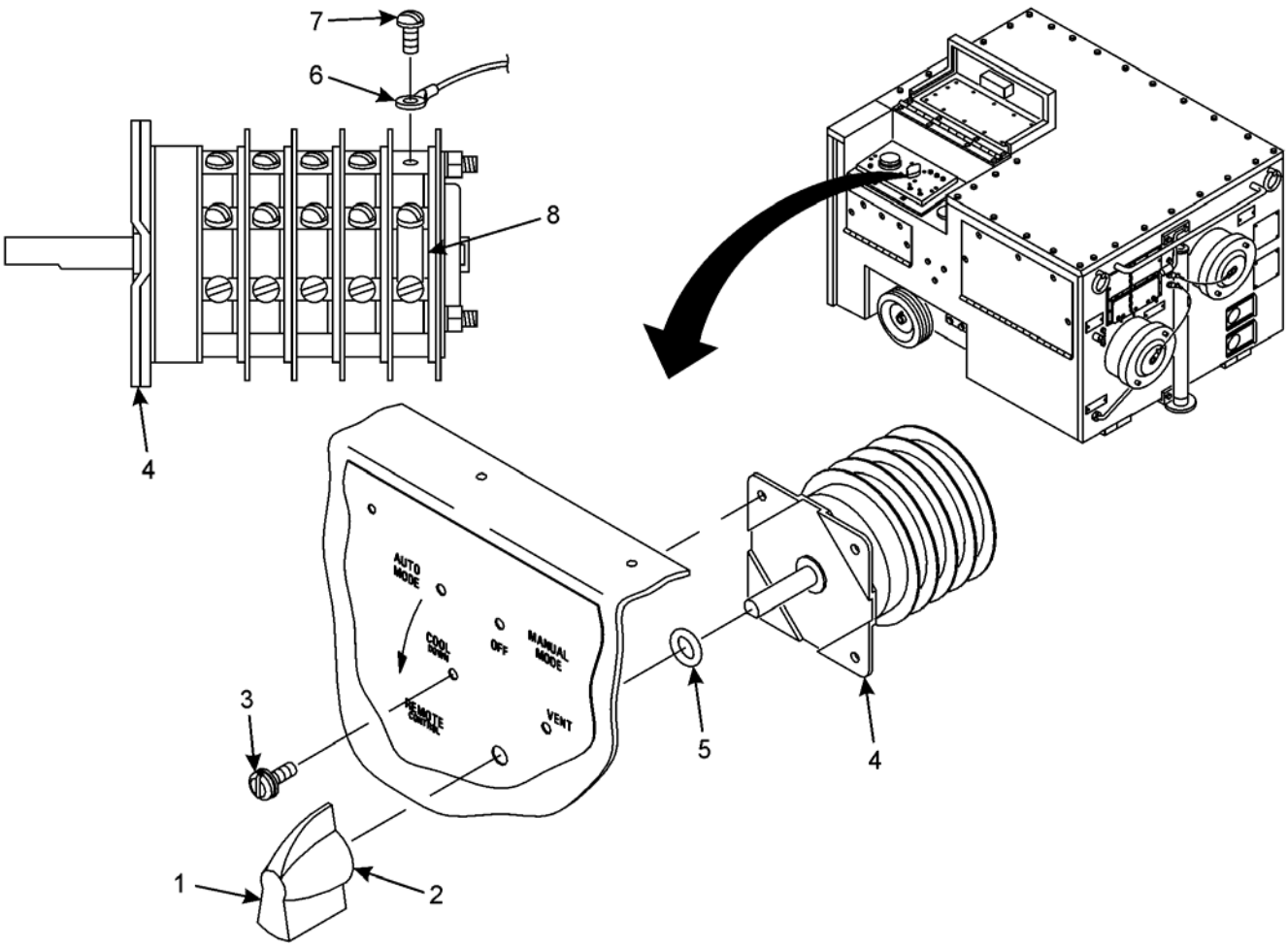
3. Apply light coat of acrylic lacquer sealer to all MODE SWITCH S1 (4) terminals.

4. Install preformed packing (5) onto shaft of MODE SWITCH S1 (4).

5. Install MODE SWITCH S1 (4) and four sealing screws (3).

6. Install knob (2) and tighten setscrew (1).

ASSEMBLY – Continued



END OF WORK PACKAGE

UNIT MAINTENANCE INSTRUCTIONS

ARMY SPACE HEATER H-140

NSN 4520-01-477-0568

FUEL PRESSURE GAGE REMOVAL, INSTALLATION

INITIAL SETUP:

Test Equipment
None

Tools and Special Tools
Automotive general mechanic's tool kit (item 10, WP 0058 00)

Personnel Required
One

References
FM 10-67-1

Materials/Parts
Lockwasher (item 27, WP 0062 00)
Tube (item 80, WP 0047 00)

Equipment Condition
ASH disconnected from power source (WP 0005 00)

WARNING

Contact with hot components can cause burns. Allow ASH to cool down before attempting service, inspection, or maintenance activity.

FOR FUEL SPILLS, REFER TO FM 10-67-1, CONCEPTS AND EQUIPMENT OF PETROLEUM OPERATIONS.

Fuel is flammable and toxic to eyes, skin, and respiratory tract. Skin/eye protection is required. Avoid repeated/prolonged contact. Use only in well-ventilated areas. Keep away from open flames or other sources of ignition. Post FUEL FLAMMABLE/NO SMOKING signs around the area. Be sure a fire extinguisher is available.

Fuel on clothing can be fatal if ignited by a static discharge. If fuel gets on clothes, leave the refueling area as soon as possible, remove clothes, and wash skin with warm, soapy water before getting dressed.

Spilled fuel creates a flammable, vapor-air mixture and fire can take place. Improper positioning of external fuel source can cause fuel tank to overflow. Stop refueling immediately if fuel spill occurs.

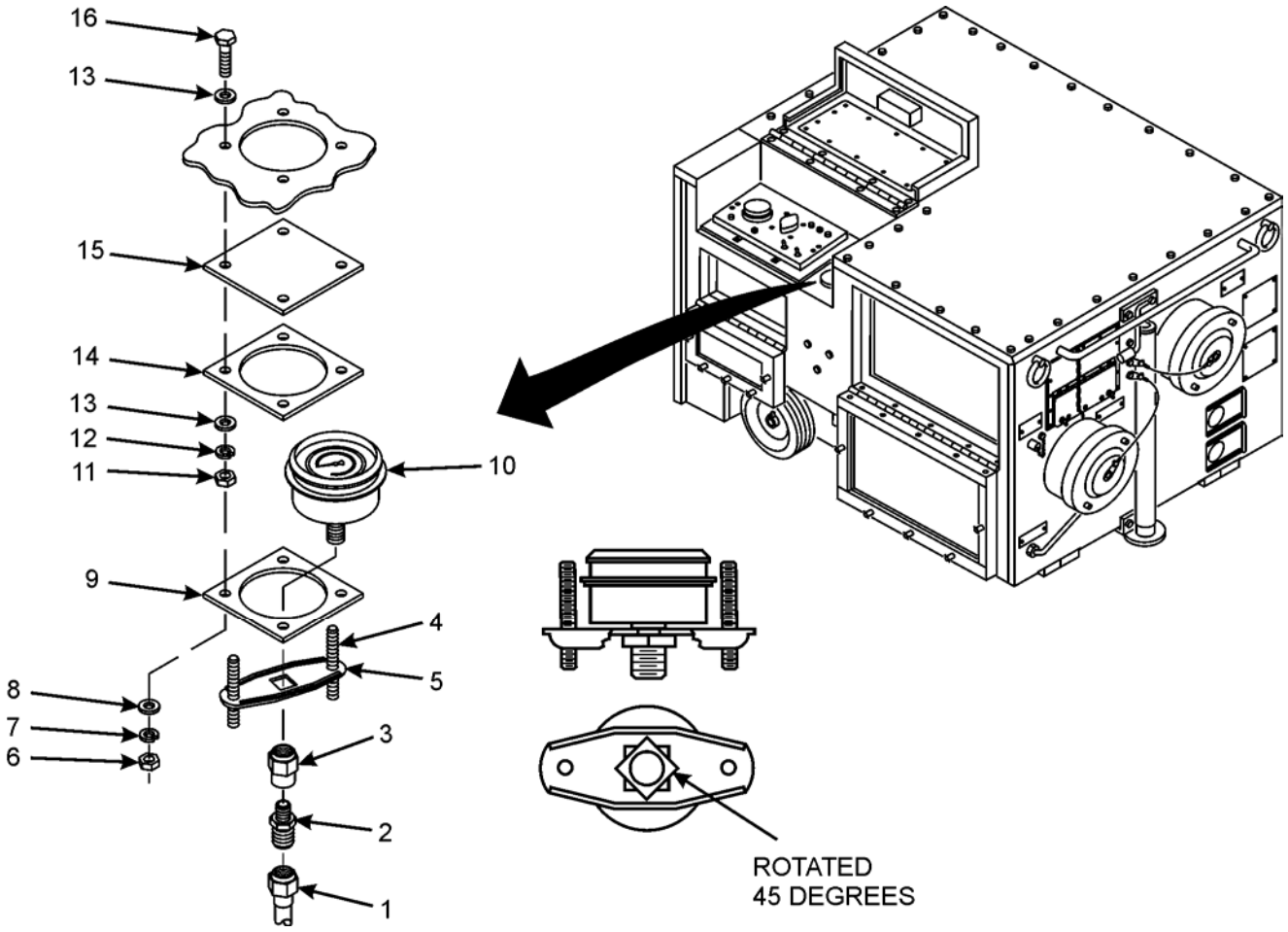
REMOVAL

1. Disconnect tube assembly (1), male connector (2), and reducer (3).

2. Loosen two setscrews (4), rotate bracket (5) 45 degrees (800 mils), and remove bracket.

3. Remove four nuts (6), lockwashers (7), washers (8), bracket (9), and gage (10). Discard lockwashers.

4. Remove four nuts (11), lockwashers (12), eight washers (13), bracket (14), lens (15), and four screws (16). Discard lockwashers.



INSTALLATION

1. Install four screws (16), eight washers (13), lens (15), bracket (14), four lockwashers (12), and nuts (11).

NOTE

Ensure that gage face is readable and straight when standing in front of the control box.

2. Install gage (10), bracket (9), four washers (8), lockwashers (7), and nuts (6).
3. Install bracket (5), rotate 45 degrees (800 mils), and tighten two setscrews (4).
4. Install reducer (3), male connector (2), and tube assembly (1).

END OF WORK PACKAGE

UNIT MAINTENANCE INSTRUCTIONS

ARMY SPACE HEATER H-140

NSN 4520-01-477-0568

AIR PRESSURE SWITCH
TESTING, REMOVAL, REPAIR, INSTALLATION, ADJUSTMENT

INITIAL SETUP:

Test Equipment
Multimeter (item 1, WP 0058 00)

Tools and Special Tools
Automotive general mechanic's tool kit (item 10, WP 0058 00)

Personnel Required
One

References
FM 4-25.11

Materials/Parts
Lockwasher (item 21, WP 0062 00)
Wire marker tag (item 25, WP 0061 00)

Equipment Conditions
None

WARNING

Contact with hot components can cause burns. Allow ASH to cool down before attempting service, inspection, or maintenance activity.

TESTING

WARNING

FOR ARTIFICIAL RESPIRATION, REFER TO FM 4-25.11, FIRST AID.

Electrical high voltage cannot be seen but can kill you. Electricity is unlike most other dangerous things you can come in contact with because it gives no warning and no symptoms to be wary of. Its effect is immediate. It can kill you, render you unconscious, or severely burn you.

To ensure your safety and that of other maintenance personnel, always observe the following precautions:

DO NOT perform any maintenance on electrical equipment unless all power is removed.

BE CERTAIN that there is someone assisting you who can remove power immediately.

1. Open control box cover (1) and control panel (2).
2. Connect multimeter to S1-41 and S1-24 (3). If meter indicates continuity, switch is closed. Leave multimeter connected.
3. Set multimeter to read ac voltage.
4. Connect power cable (4) to power source.

5. If meter indicated continuity in step 2, proceed to Adjustment procedure (WP 0028 00-5).

TESTING – Continued

6. Ensure that all access doors are closed. Do not close control panel (2).

7. Set MODE SWITCH (5) to VENT position and observe meter indication:

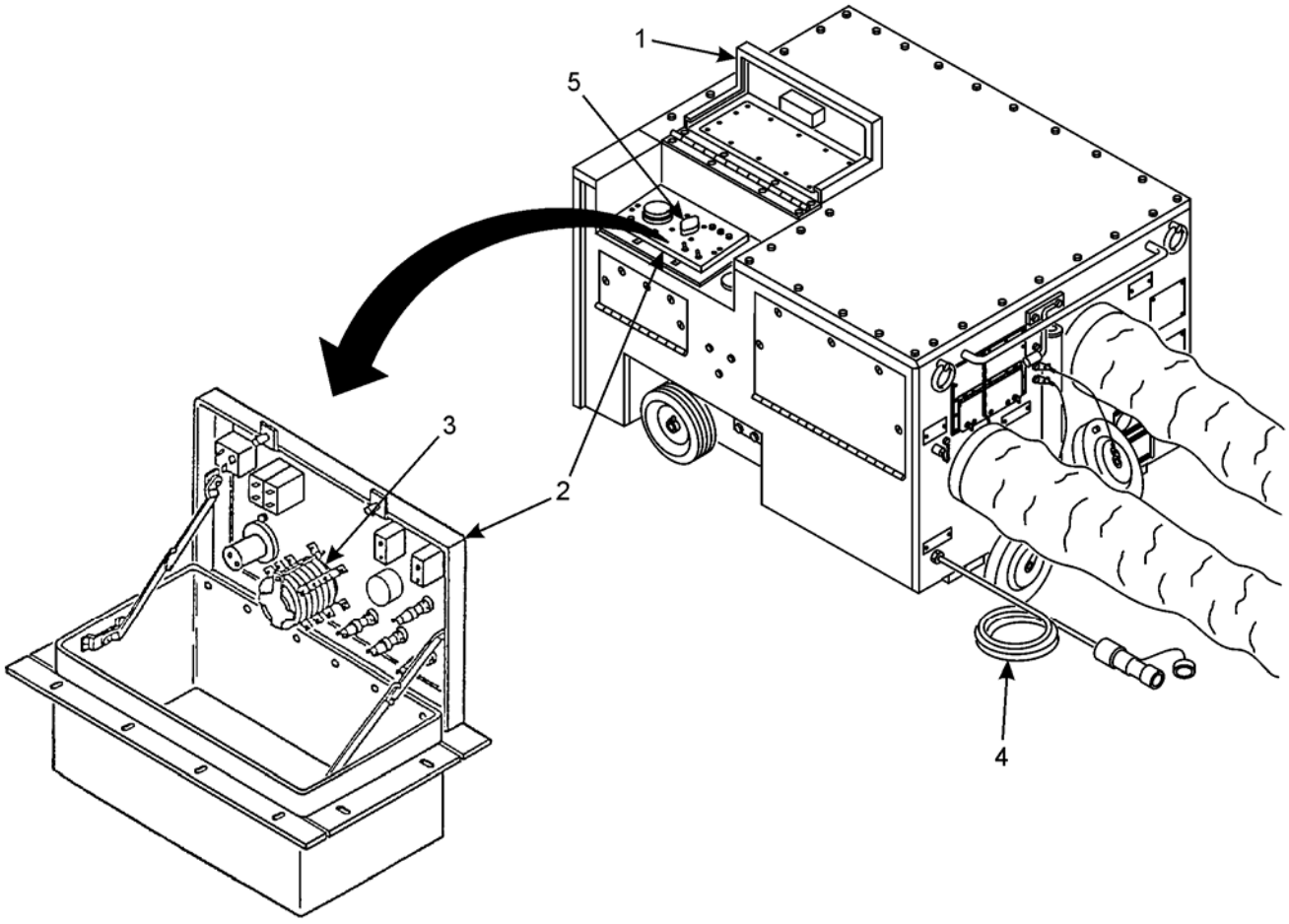
   a. If air switch closes (operating correctly), meter will indicate 0 Vac. Proceed to step 6.

   b. If air switch does not close, meter will indicate 120 Vac. Switch is open. Leave multimeter attached and proceed to Adjustment procedure (WP 0028 00-5).

8. Set MODE SWITCH (5) to OFF position.

9. Disconnect multimeter and close control panel (2) and control box cover (1).

10. Disconnect power cable (4) from power source.



REMOVAL

1. Open side rear door (1) and side front door (2).
2. Tag and disconnect wires (3 and 4) from air switch (5).
3. Remove tube (6) fittings (7 and 8).
4. Remove two nuts (9), lockwashers (10), washers (11), screws (12), and air switch (5). Discard lockwashers.

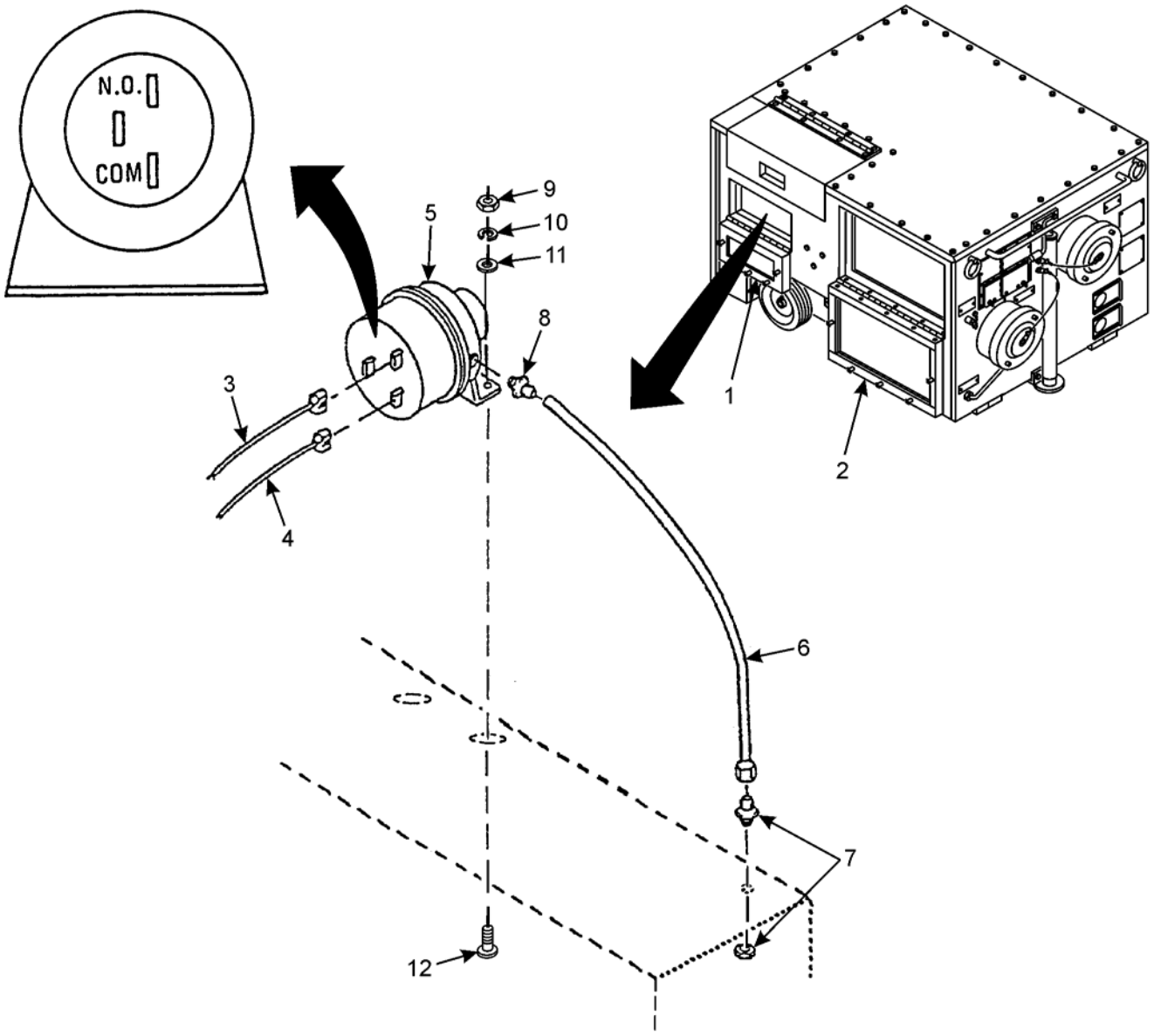
REPAIR

Repair is limited to replacement of defective parts.

INSTALLATION

1. Install air switch (5), two screws (12), washers (11), lockwashers (10), and nuts (9).
2. Install fittings (8 and 7) and tube (6).
3. Connect wires (4 and 3) to air switch (5). Remove wire marker tags.
4. Close side front door (2) and side rear door (1).

INSTALLATION – Continued



ADJUSTMENT

WARNING

FOR ARTIFICIAL RESPIRATION, REFER TO FM 4-25.11, FIRST AID.

Electrical high voltage cannot be seen but can kill you. Electricity is unlike most other dangerous things you can come in contact with because it gives no warning and no symptoms to be wary of. Its effect is immediate. It can kill you, render you unconscious, or severely burn you.

To ensure your safety and that of other maintenance personnel, always observe the following precautions:

DO NOT perform any maintenance on electrical equipment unless all power is removed.

BE CERTAIN that there is someone assisting you who can remove power immediately.

1. Disconnect power cable (1) from power source.
2. Remove return air hose assembly (2) from ASH.
3. Open side rear door (3).
4. If testing indicates air switch was closed, proceed as follows:
   a. Remove cover (4) from air switch (5) and loosen locknut (6).
   b. Turn adjustment screw (7) clockwise (in) until meter indicates 120 Vac. Turn adjustment screw (7) one-quarter turn more.
   c. Tighten locknut (6), install cover (4), and proceed to step 13.
5. If testing indicated air switch is open, proceed to step 6.
6. Remove cover (4) from air switch (5), loosen locknut (6), and turn adjustment screw (7) one-half turn counterclockwise (out).
7. Close rear side door (3).
8. Connect power cable (1) to power source.
9. Set MODE SWITCH (8) to VENT position and observe meter indication:
   a. If air switch (5) closes (operating correctly), meter will indicate 0 Vac. Set MODE SWITCH (8) to OFF position and proceed to step 10.
   b. If air switch (5) does not close, meter will indicate 120 Vac. Repeat steps 1 thru 9.
   c. If air switch (5) does not close after turning adjustment screw (7) completely clockwise (in), replace air switch.
10. Disconnect multimeter and close control panel (9) and control panel cover (10).
11. Open rear side door (3).

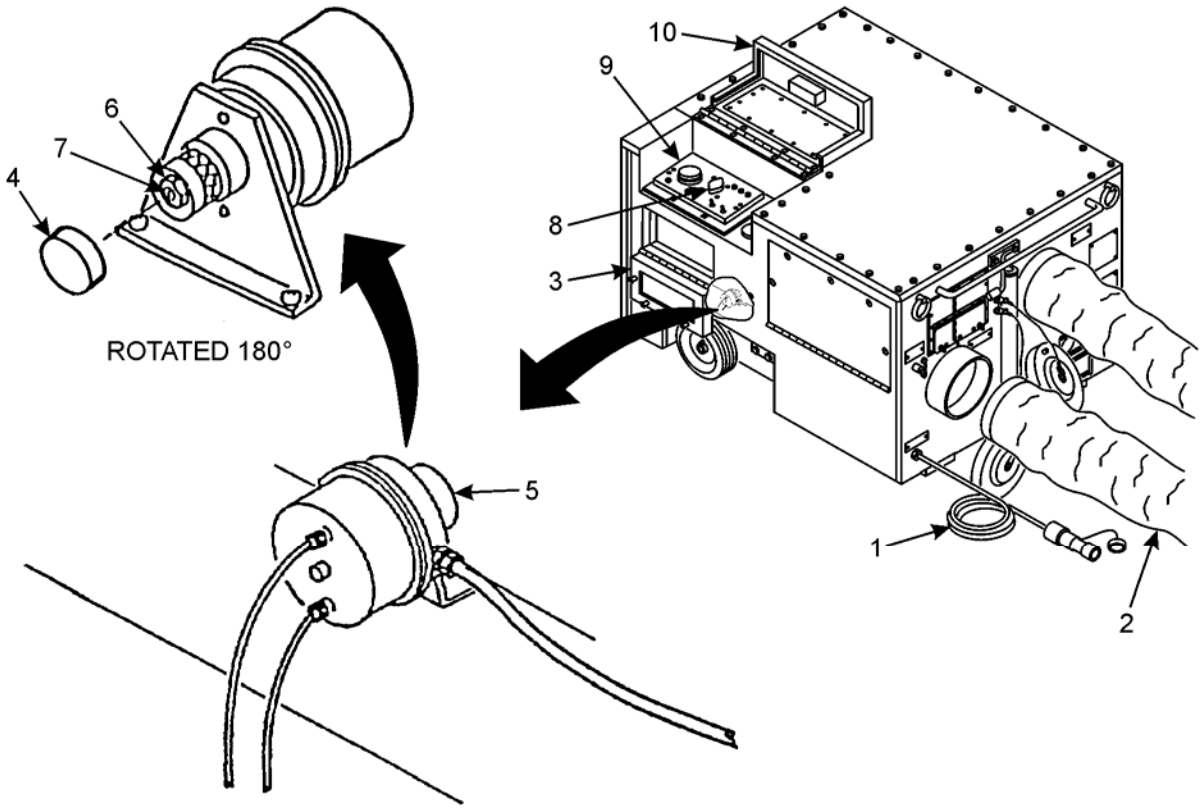
ADJUSTMENT – Continued

12. Tighten locknut (6) and install cover (4).

13. Close side rear door (3).

14. Connect return air hose assembly (2) to ASH.

15. Disconnect power cable (1) from power source.



END OF WORK PACKAGE

UNIT MAINTENANCE INSTRUCTIONS

ARMY SPACE HEATER H-140

NSN 4520-01-477-0568

FUEL TANK ASSEMBLY
REMOVAL, DISASSEMBLY, REPAIR, ASSEMBLY, INSTALLATION

INITIAL SETUP:

Test Equipment
None

Tools and Special Tools
Automotive general mechanic's tool kit (item 10, WP 0058 00)
Drain pan (item 6, WP 0058 00)

Personnel Required
One

References
FM 10-67-1

Materials/Parts
Gasket sealing compound (item 18, WP 0061 00)
Locknut (item 14, WP 0062 00)
Lockwasher (item 27, WP 0062 00)
Lockwasher (item 28, WP 0062 00)
Preformed packing (item 11, WP 0062 00)
Sealing compound (item 17, WP 0061 00)
Tube (item 77, WP 0047 00)
Tube (item 79, WP 0047 00)

Equipment Condition
ASH disconnected from power source (WP 0005 00)
Rear panel assembly removed (WP 0022 00)

WARNING

Contact with hot components can cause burns. Allow ASH to cool down before attempting service, inspection, or maintenance activity.

FOR FUEL SPILLS, REFER TO FM 10-67-1, CONCEPTS AND EQUIPMENT OF PETROLEUM OPERATIONS.

Fuel is flammable and toxic to eyes, skin, and respiratory tract. Skin/eye protection is required. Avoid repeated/prolonged contact. Use only in well-ventilated areas. Keep away from open flames or other sources of ignition. Post FUEL FLAMMABLE/NO SMOKING signs around the area. Be sure a fire extinguisher is available.

Fuel on clothing can be fatal if ignited by a static discharge. If fuel gets on clothes, leave the refueling area as soon as possible, remove clothes, and wash skin with warm, soapy water before getting dressed.

Spilled fuel creates a flammable, vapor-air mixture and fire can take place. Improper positioning of external fuel source can cause fuel tank to overflow. Stop refueling immediately if fuel spill occurs.

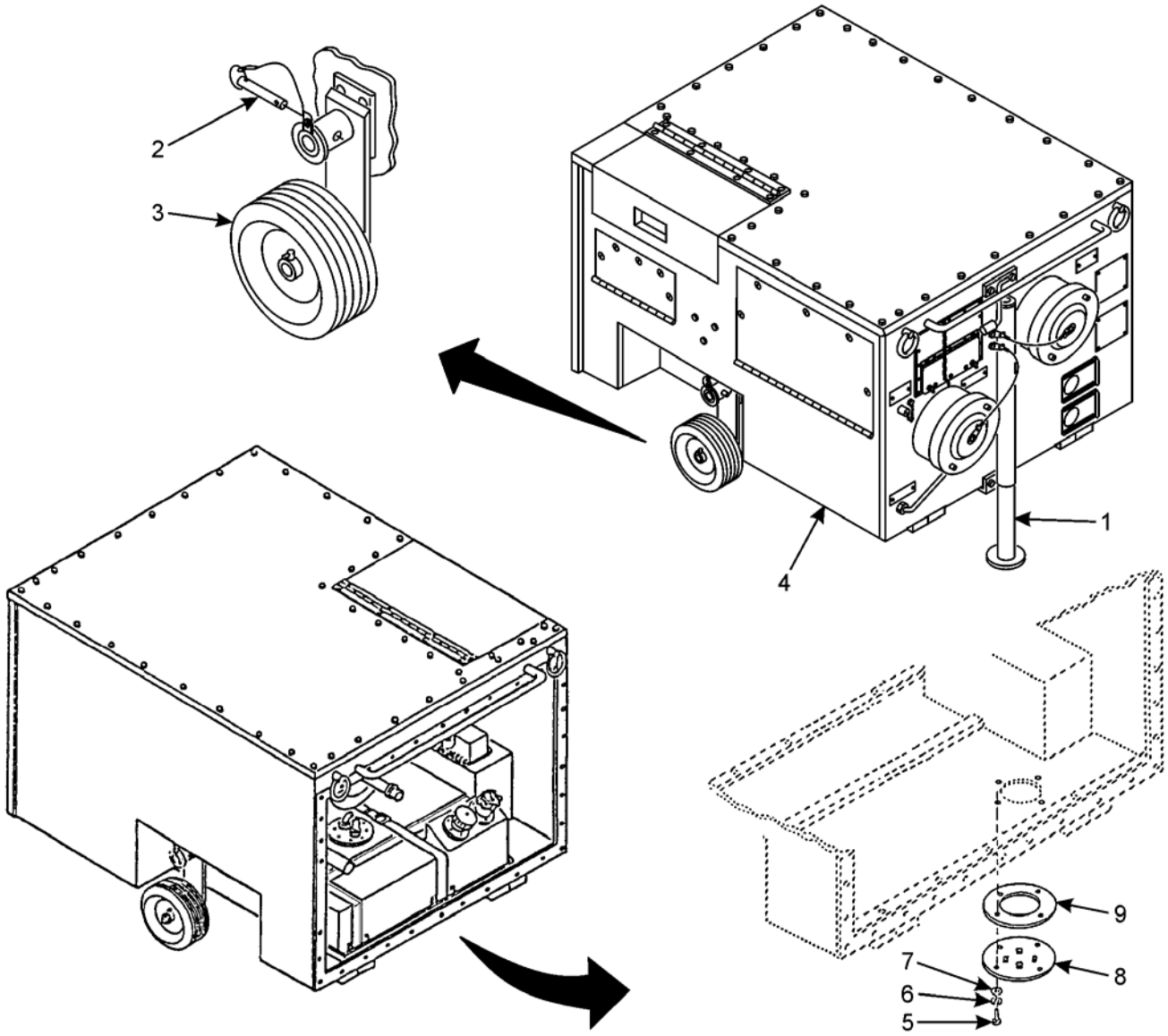
Use care when using the jack assembly or when raising or lowering the wheel assemblies. Fingers or hands may be pinched causing injury to personnel.

REMOVAL

WARNING

Use care when using the jack assembly or when raising or lowering the wheel assemblies. Fingers or hands may be pinched causing injury to personnel.

1. Extend jack assembly (1), remove pin (2), place wheel assembly (3) in down position, and insert pin (2).
2. Retract jack assembly (1) until front of ASH (4) is resting on ground.
3. Remove four screws (5), lockwashers (6), washers (7), fuel drain cover (8), and gasket (9). Discard lockwashers.

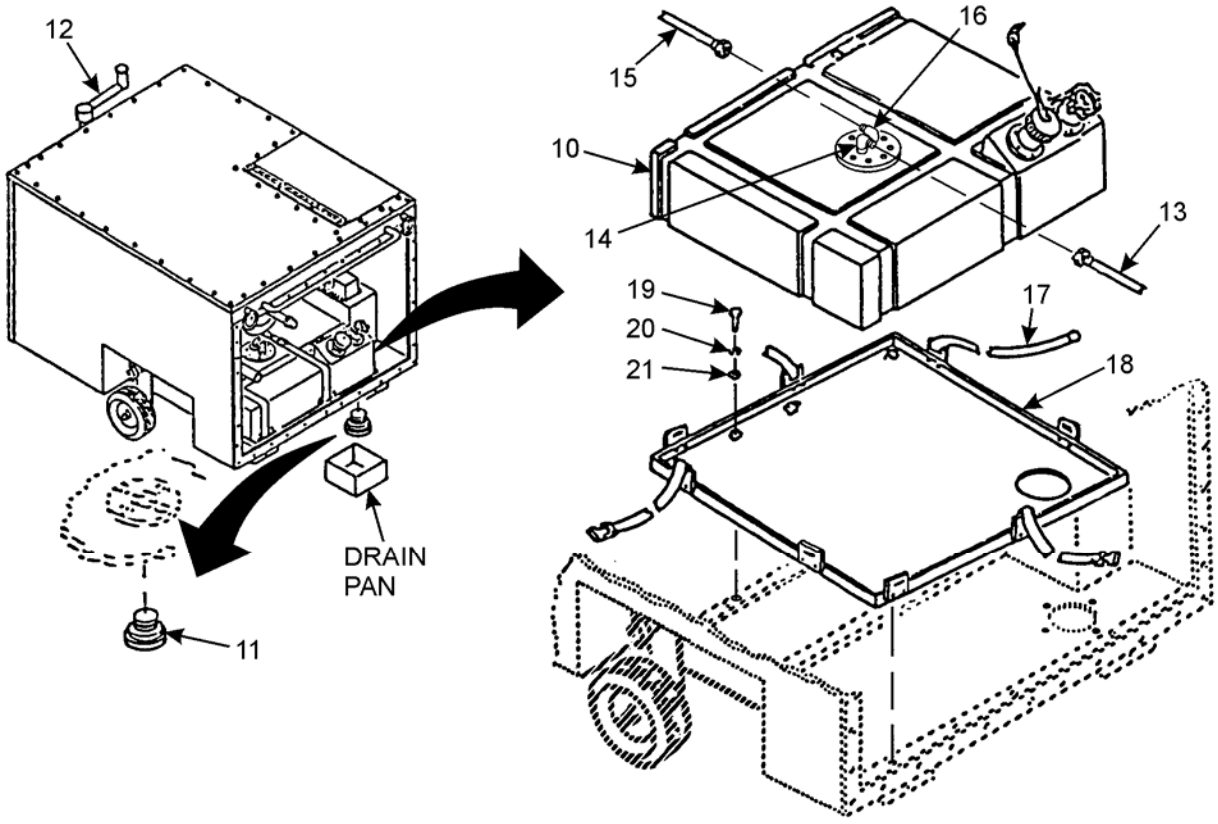


REMOVAL – Continued

NOTE

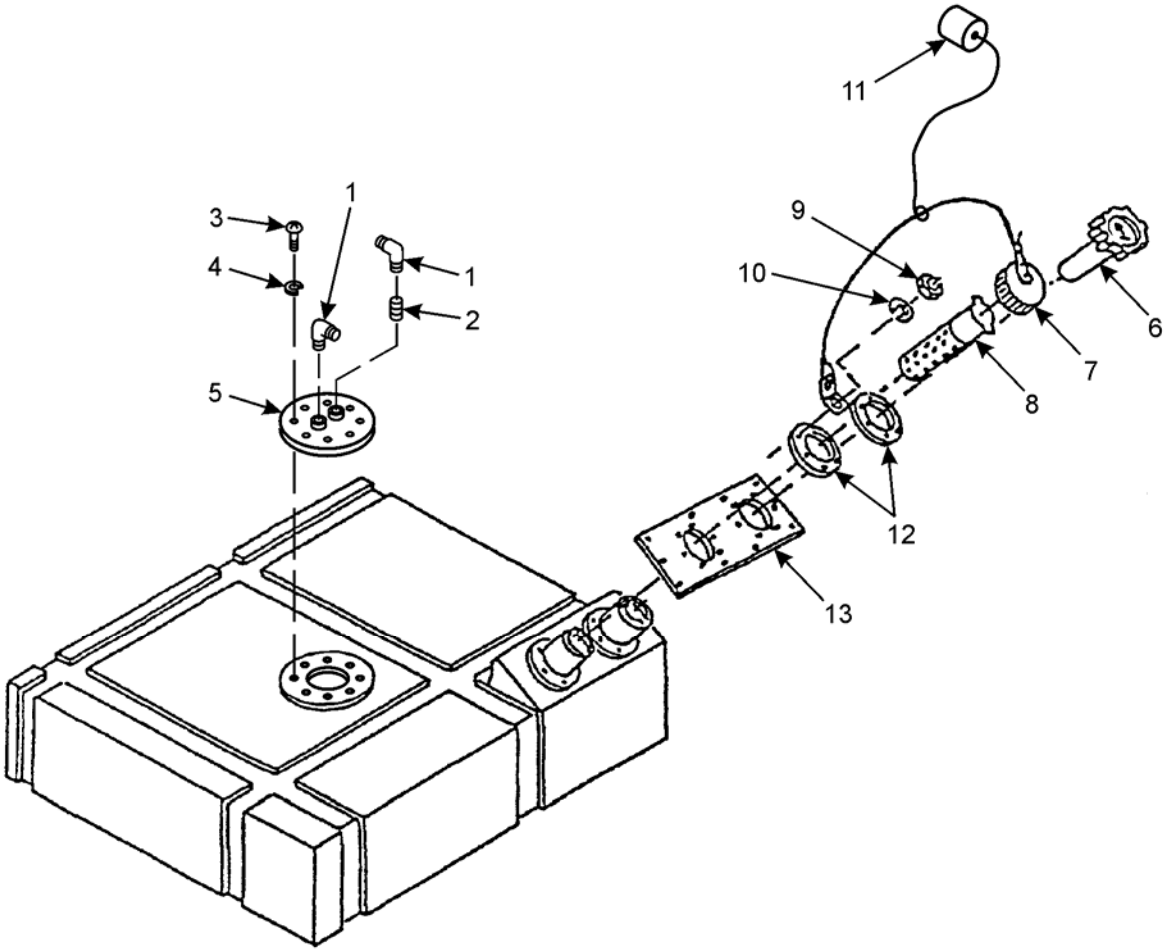
Fuel tank assemblies holds 14 gallons (53L). Drain pan may need to be drained repeatedly.

4. Position drain pan under fuel tank assembly (10).
5. Remove drain plug (11).
6. Extend jack assembly (12) while emptying fuel tank assembly (10) until ASH is level.
7. When fuel tank assembly (10) is empty, install drain plug (11).
8. Remove tube assembly (13) from elbow (14) and tube assembly (15) from elbow (16) on fuel tank assembly (10).
9. Unfasten two straps (17).
10. Lift fuel tank assembly (10) from tray (18).
11. Remove eight screws (19), lockwashers (20), washers (21), and tray (18). Discard lockwashers.



DISASSEMBLY

1. Remove two elbows (1) and bushing (2).
2. Remove eight screws (3), lockwashers (4), and mounting plate (5). Discard lockwashers.
3. Remove fuel gage (6), filler cap (7), and fuel screen (8).
4. Remove 12 nuts (9), lockwashers (10), filler cap (7) with dust cap (11), two filler neck rings (12), and isolator (13). Discard lockwashers.

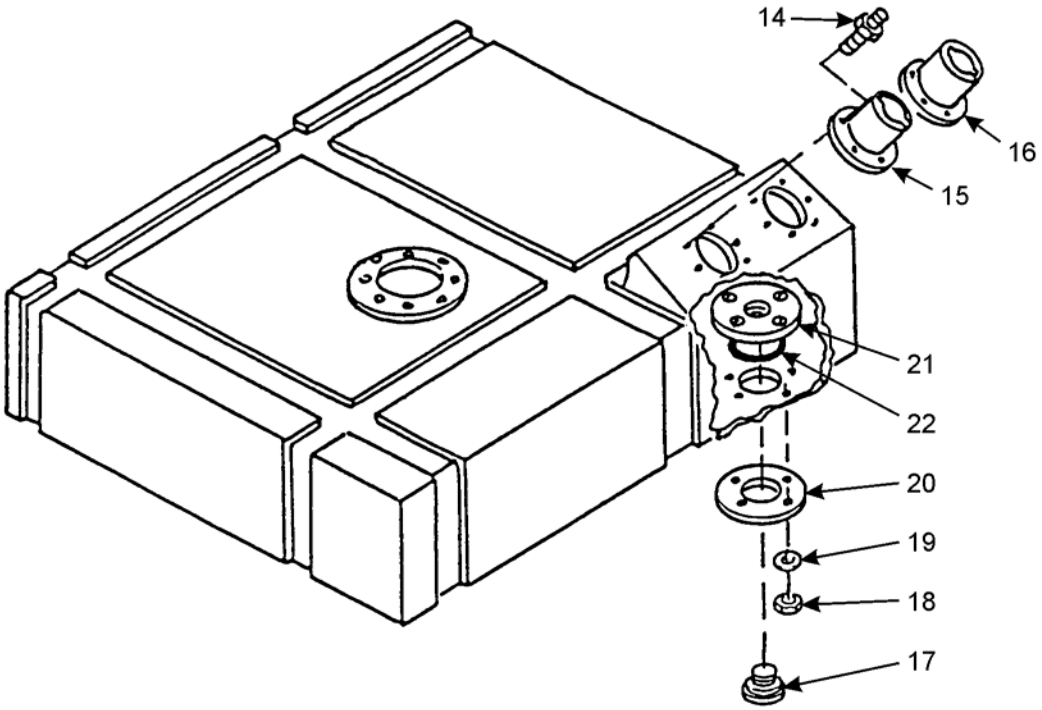


DISASSEMBLY – Continued

NOTE

Notice the orientation of the filler neck and the fuel gage neck to ensure correct assembly.

5. Remove 12 space adapters (14), filler neck (15), and fuel gage neck (16).
6. Remove drain plug (17).
7. Remove four locknuts (18), four washers (19), and ring washer (20). Discard locknuts.
8. Remove drain port (21) and preformed packing (22).



REPAIR

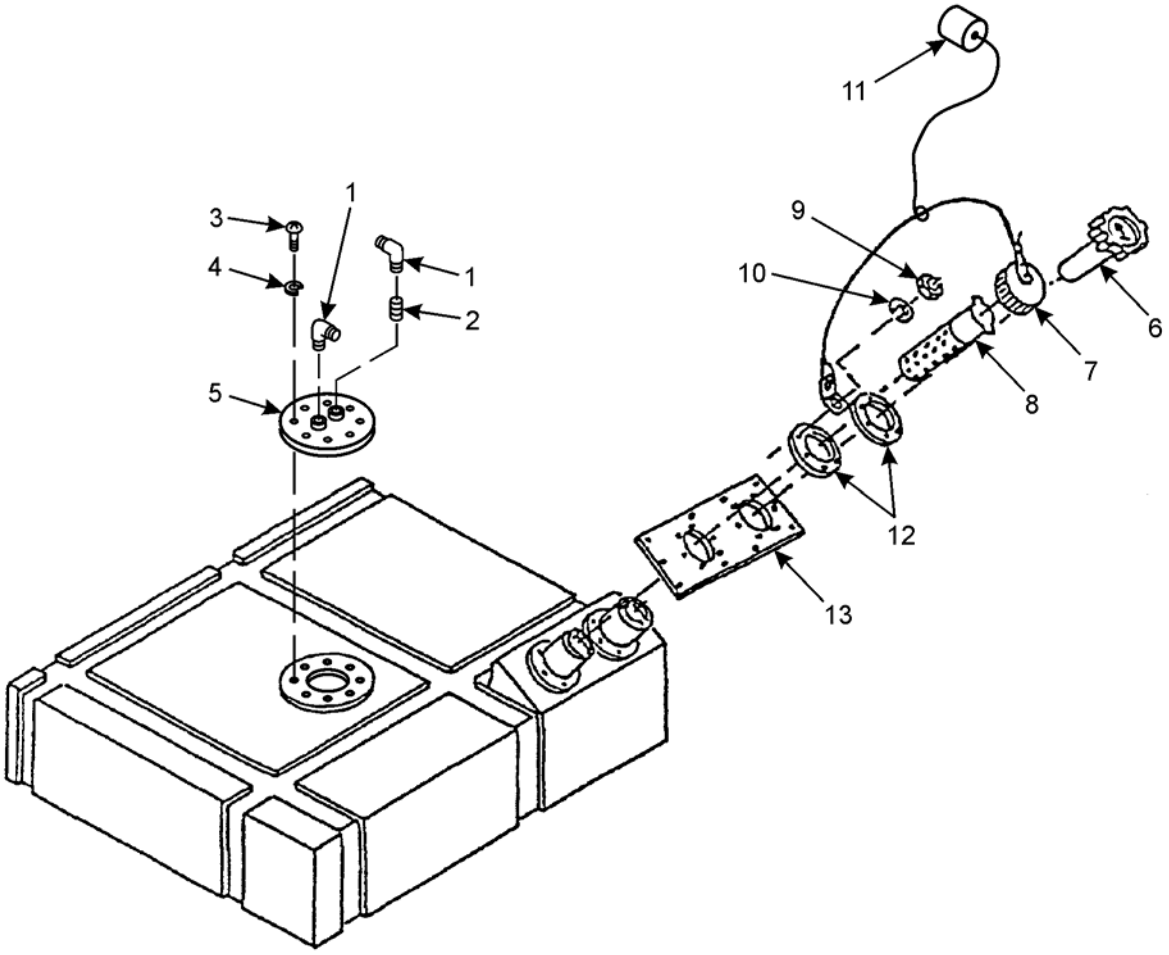
Repair is limited to replacement of defective parts.

ASSEMBLY

1. Apply gasket sealing compound to drain port (21) and ring washer (20).
2. Install preformed packing (22) and drain port (21).
3. Apply gasket sealing compound and install ring washer (20), four washers (19), and locknuts (18).
4. Install drain plug (17).
5. Apply sealing compound to 12 space adapters (14).
6. Install fuel gage neck (16), filler neck (15), and 12 space adapters (14) per orientation noted during disassembly.

ASSEMBLY – Continued

7. Install isolator (13) and two filler neck rings (12).
8. Install loose end of filler cap (7) cable with dust cap (11), 12 lockwashers (10) (item 27, WP 0062 00), and nuts (9).
9. Install fuel screen (8), fuel cap (7) and fuel gage (6).
10. Apply gasket sealing compound to bottom outer edge of mounting plate (5).
11. Install mounting plate (5), eight lockwashers (4) (item 27, WP 0062 00), and eight screws (3).
12. Install bushing (2) and two elbows (1).



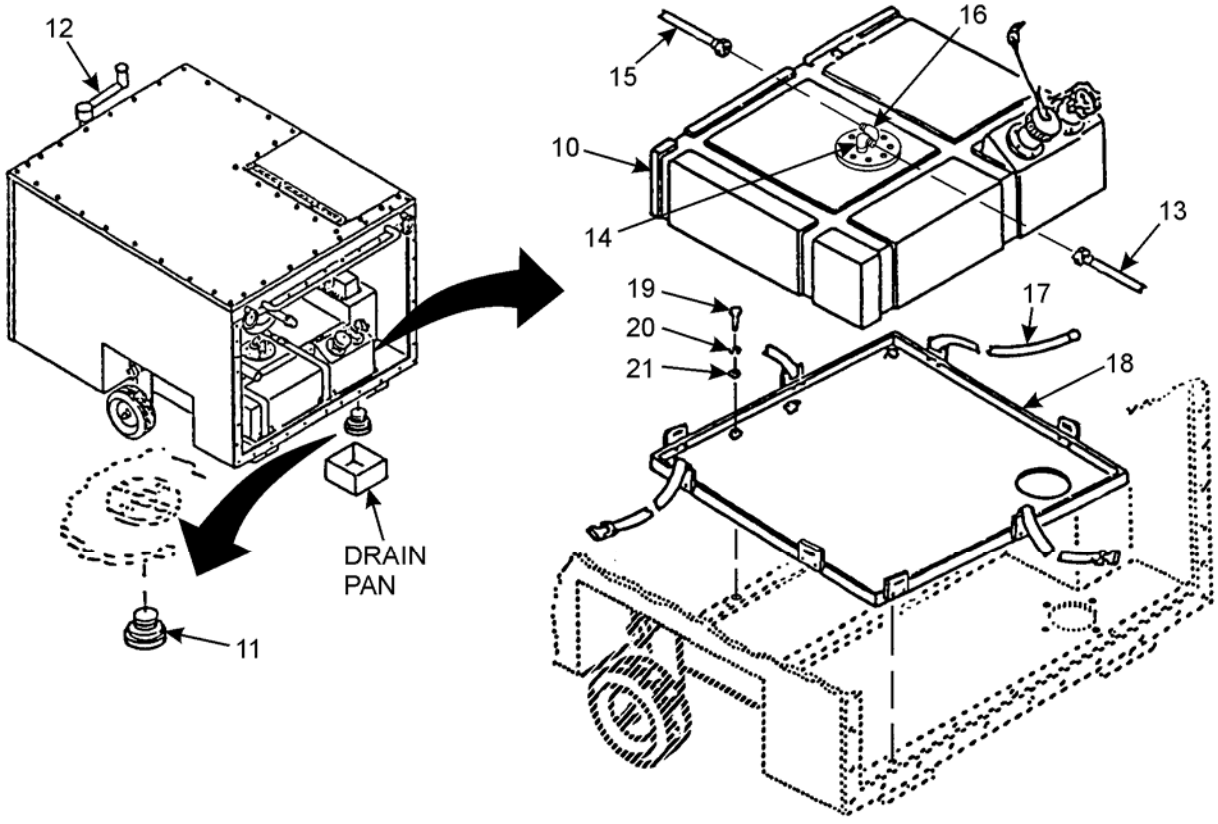
INSTALLATION

1. Install tray (18), eight washers (21), lockwashers (20) (item 28, WP 0062 00), and screws (19).
2. Install fuel tank (10) onto tray (18) and fasten two straps (17).
3. Apply sealing compound to male threads of elbows (14 and 16).
4. Connect tube assembly (15) (item 77, WP 0047 00) to elbow (16) and connect tube assembly (13) (item 79, WP 0047 00) to elbow (14) on fuel tank (10).

WARNING

Use care when using the jack assembly or when raising or lowering the wheel assemblies. Fingers or hands may be pinched causing injury to personnel.

5. Retract jack assembly (12) and ensure that drain plug (11) is installed.



INSTALLATION - Continued

6. Install gasket (9), fuel drain cover (8), four washers (7), lockwashers (6) (item 28, WP 0062 00), and screws (5).

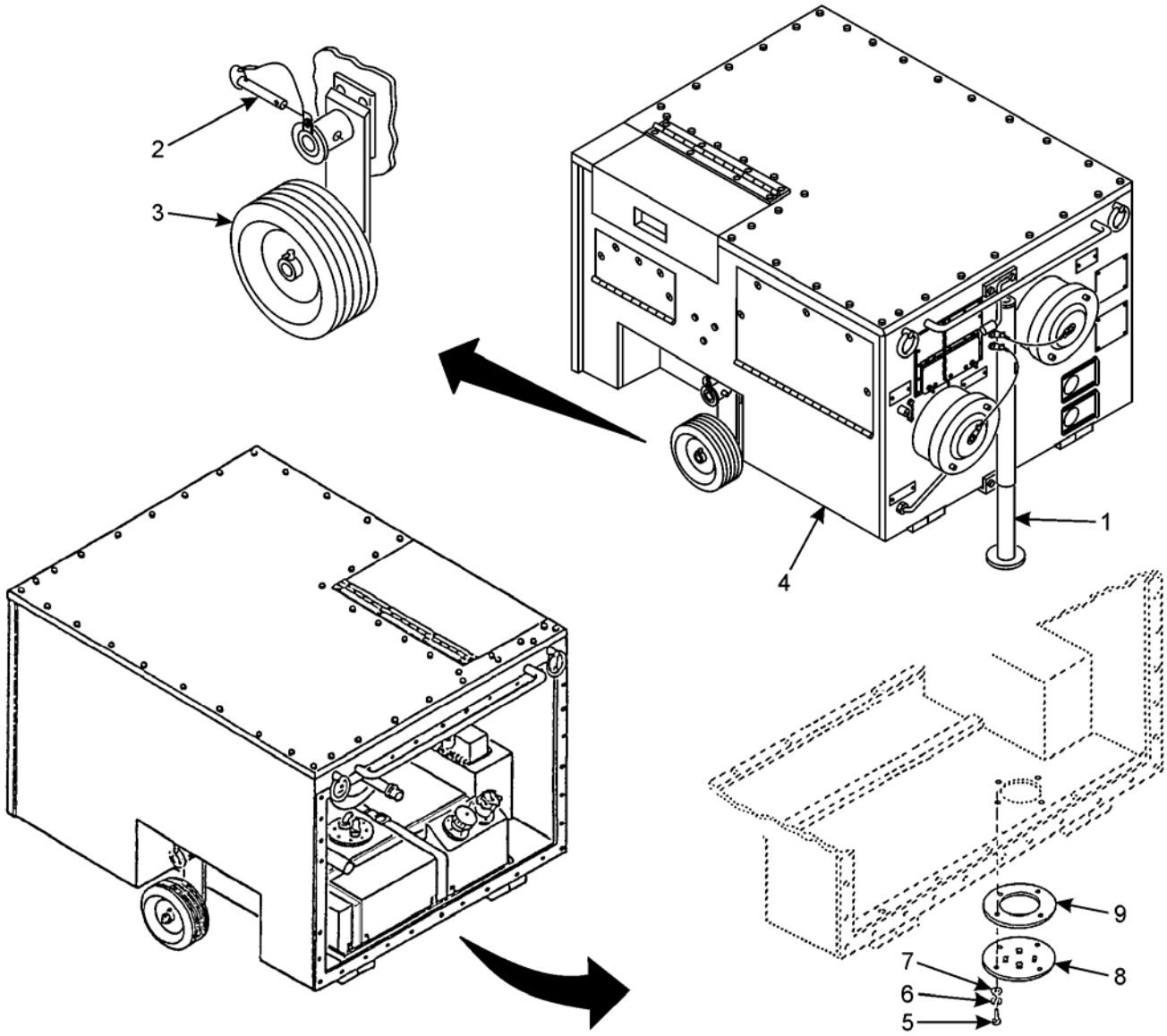
WARNING

Use care when using the jack assembly or when raising or lowering the wheel assemblies. Fingers or hands may be pinched causing injury to personnel.

7. Extend jack assembly (1), remove pin (2), place wheel assembly (3) in up position and install pin (2).

6. Retract jack assembly (1) until front of ASH (4) is resting on ground.

7. Refill fuel tank with fuel.



END OF WORK PACKAGE

UNIT MAINTENANCE INSTRUCTIONS

IMPROVED ARMY SPACE HEATER H-140

NSN 4520-01-477-0568

FUEL PUMP AND SOLENOID VALVES REMOVAL, DISASSEMBLY, REPAIR, ASSEMBLY, INSTALLATION, ADJUSTMENT

INITIAL SETUP:

Test Equipment
None

Tools and Special Tools
Automotive general mechanic's tool kit (item 10, WP 0058 00)
Soft-faced vise (item 6, WP 0058 00)

Personnel Required
One

References
WP 0002 00, table 3
WP 0005 00
WP 0045 00
FM 10-67-1

Materials/Parts
Cotter pin (item 16, WP 0062 00)
Lockwasher (item 30, WP 0062 00)
Lockwasher (item 26, WP 0062 00)
Sealing Compound (item 17, WP 0061 00)
Thread locking sealing compound (item 21, WP 0061 00)
Tube (item 75, WP 0047 00)
Tube (item 76, WP 0047 00)
Tube (item 79, WP 0047 00)
Tube (item 80, WP 0047 00)
Wire (item 60, table 1, WP 0049 00)
Wire (item 81, table 1, WP 0049 00)
Wire marker tag (item 24, WP 0061 00)
Wire tie (item 25, WP 0061 00)

Equipment Condition
ASH disconnected from power source (WP 0005 00)
Top panel assembly removed (WP 0021 00)

WARNING

Contact with hot components can cause burns. Allow IASH to cool down before attempting service, inspection, or maintenance activity.

FOR FUEL SPILLS, REFER TO FM 10-67-1, CONCEPTS AND EQUIPMENT OF PETROLEUM OPERATIONS.

Fuel is flammable and toxic to eyes, skin, and respiratory tract. Skin/eye protection is required. Avoid repeated/prolonged contact. Use only in well-ventilated areas. Keep away from open flames or other sources of ignition. Post FUEL FLAMMABLE/NO SMOKING signs around the area. Be sure a fire extinguisher is available.

Fuel on clothing can be fatal if ignited by a static discharge. If fuel gets on clothes, leave the refueling area as soon as possible, remove clothes, and wash skin with warm, soapy water before getting dressed.

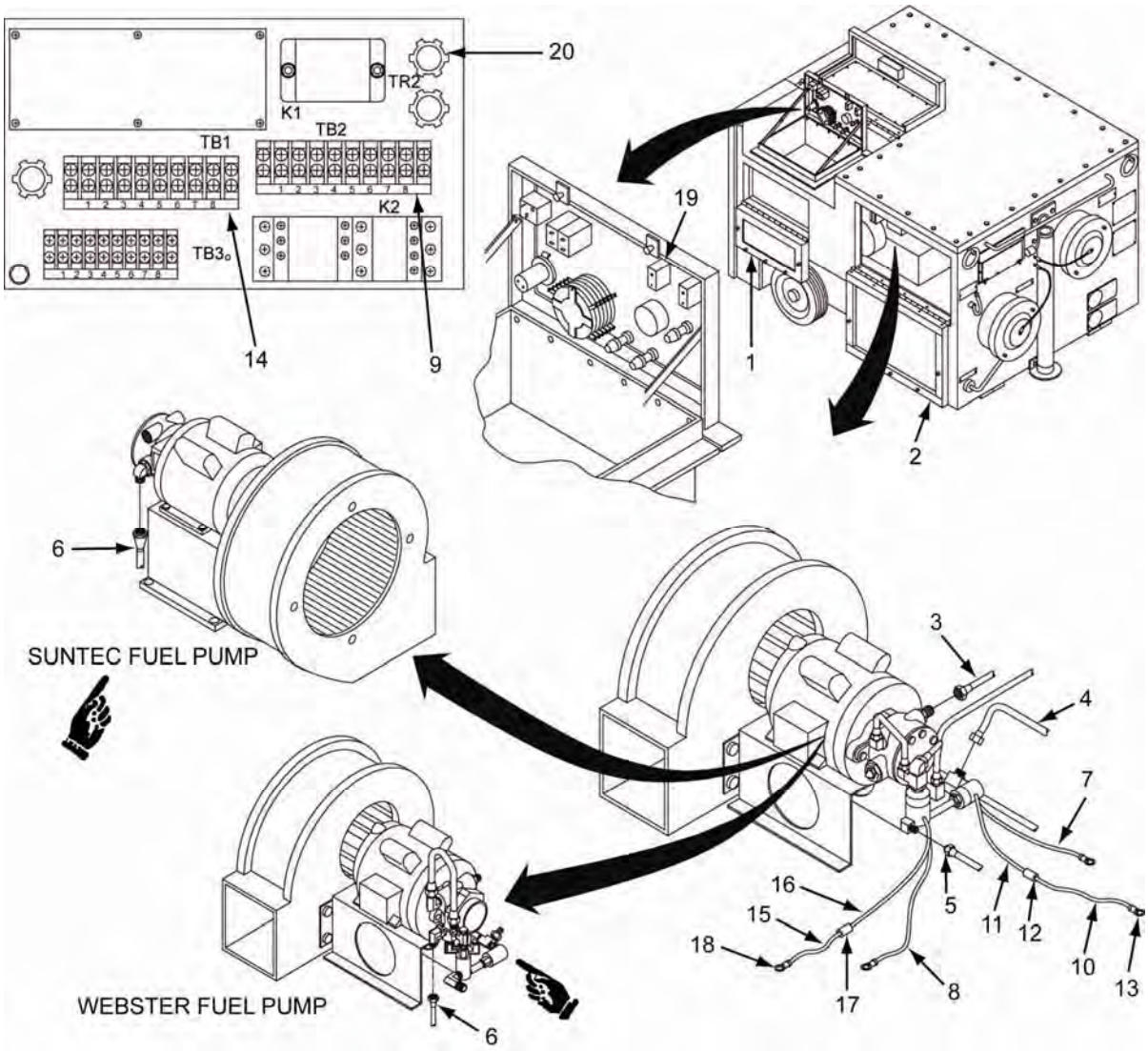
Spilled fuel creates a flammable, vapor-air mixture and fire can take place. Improper positioning of external fuel source can cause fuel tank to overflow. Stop refueling immediately if fuel spill occurs.

NOTE

Procedures in this work package apply to either the Suntec Fuel Pump (P/N J6BC-325-3) or the Webster Fuel Pump (P/N 60889-1).

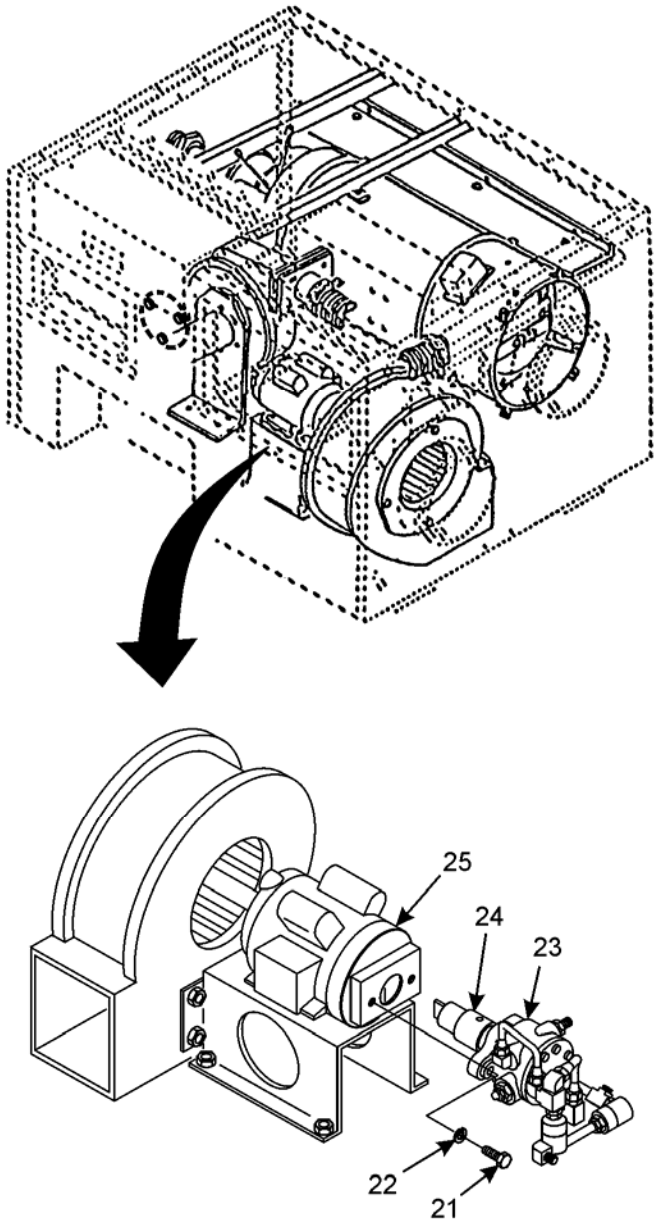
REMOVAL

1. Open side rear door (1) and side front door (2).
2. Disconnect hose assembly (3) and tube assemblies (4 thru 6).
3. Open control panel. Tag and disconnect two wires TB2-7/L1-BLK (7) and TB2-4/L2-BLK (8) from terminal board TB2 (9).
4. Cut wire ties as required.
5. Tag and disconnect wire TB1-8/L1-BLK (10) with solenoid valve L1 lead (11), terminal splice (12), and terminal lug (13) attached from terminal board TB1 (14).
6. Tag and disconnect wire S4-1/L2-BLK (15) with solenoid valve L2 lead (16), terminal splice (17), and terminal lug (18) attached from PURGE SWITCH S4 (19).
7. Route all disconnected wires down through conduit (20).



REMOVAL – Continued

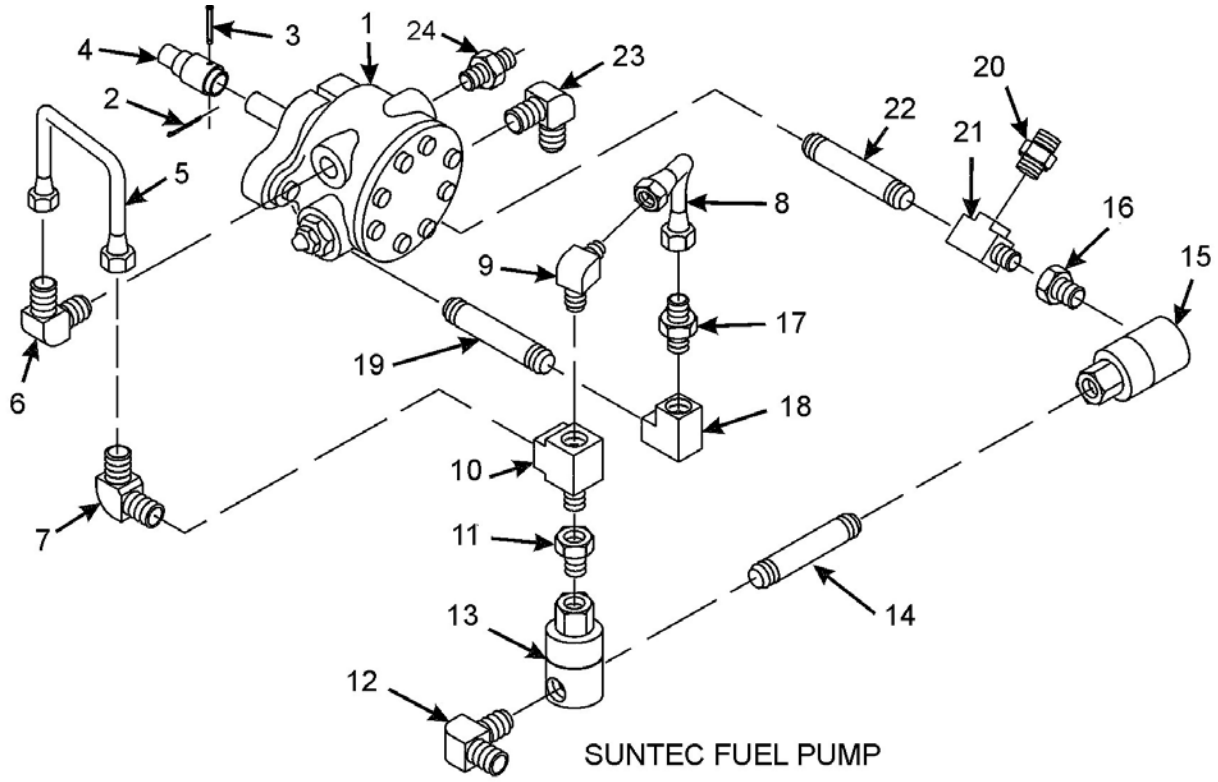
8. Remove two screws (21) and lockwashers (22) and disengage pump assembly (23) and fuel coupling (24) from motor (25). Discard lockwashers.



DISASSEMBLY

Suntec Fuel Pump

1. Place pump (1) into soft-faced vise.
2. Remove cotter pin (2), spring pin (3), and fuel coupling (4).
3. Remove tube assembly (5) and elbows (6 and 7).
4. Remove tube assembly (8) and elbow (9).
5. Remove tee (10), and pipe bushing (11).
6. Remove elbow (12) and 3-way solenoid valve (13)..
7. Remove nipple (14), solenoid valve (15), and pipe bushing (16).
8. Remove straight adapter (17), elbow (18), and nipple (19).
9. Remove straight adapter (2), tee (21), and nipple (22).
10. Remove elbow (23) and straight adapter (24).
11. Remove fuel pump (1) from soft faced vise.



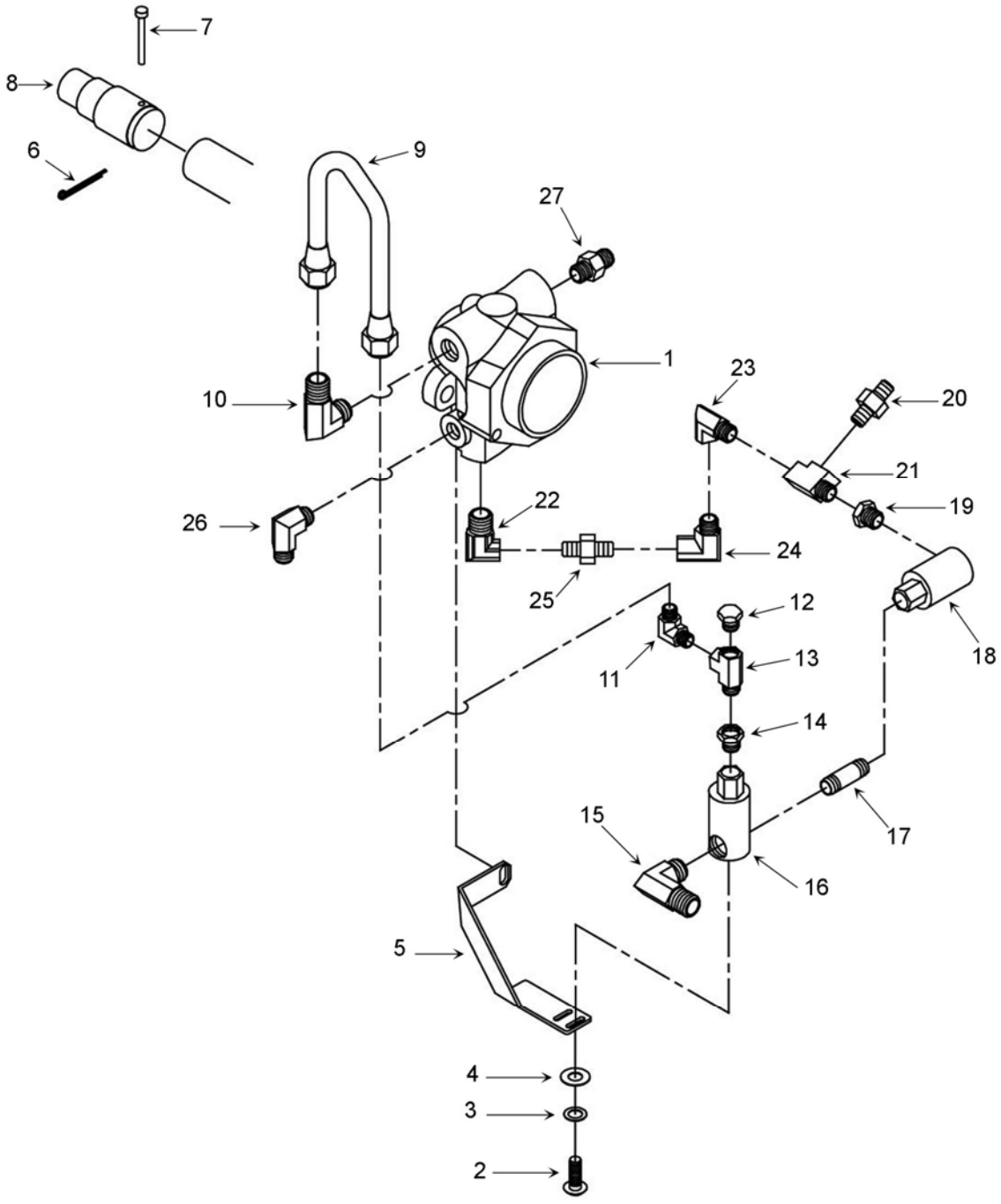
SUNTEC FUEL PUMP

DISASSEMBLY – Continued

Webster Fuel Pump

1. Place fuel pump (1) into soft-faced vise.
2. Remove two screws (2), two lockwashers (3), two washers (4), and bracket (5). Discard lockwashers.
3. Remove cotter pin (6), spring pin (7), and fuel coupling (8).
4. Remove tube assembly (9) and two elbows (10 and 11).
5. Remove pipe plug (12), tee (13), and pipe bushing (14).
6. Remove elbow (15), 3-way solenoid valve (16), and nipple (17).
7. Remove solenoid valve (18) and pipe bushing (19).
8. Remove straight adapter (20) and tee (21).
9. Rotate elbow (22) 45 degrees and remove two elbows (23 and 24) and nipple (25).
10. Remove elbow (22).
11. Remove elbow (26) and straight adapter (27).
12. Remove fuel pump (1) from soft-faced vise.

DISASSEMBLY – Continued



WEBSTER FUEL PUMP

REPAIR

Repair is limited to replacement of defective parts.

ASSEMBLY

Webster Fuel Pump

CAUTION

Do not use Teflon tape-type sealers. The tape can cause damage to the fuel pump and fuel solenoids and may clog the fuel system.

NOTE

Apply sealing compound to all male pipe threads prior to assembly.

1. Place fuel pump (1) into soft-faced vise.
2. Install elbow (26) and straight adapter (27).
3. Install elbow (22) with elbow facing out from fuel pump.
4. Install nipple (25) and elbow (24).
5. Install elbow (23) at 45 degrees from elbow (24).
6. Rotate elbow (22) 45 degrees clockwise such that elbow (23) points away from fuel pump (1).
7. Install tee (21) and straight adapter (20).

NOTE

The top fitting on the 3-way solenoid valve is an O-ring seal. Hold top fitting with a wrench when installing the nipple.

8. Install pipe bushing (19) and solenoid valve (18).
9. Install nipple (17) and 3-way solenoid valve (16) with port on 3-way solenoid valve marked IN facing nipple.

NOTE

The top fitting on the 3-way solenoid valve is an O-ring seal. Hold top fitting with a wrench when installing the pipe bushing, tee, and pipe plug.

10. Install elbow (15) to port marked NC on 3-way solenoid valve (16).
11. Install pipe bushing (14), tee (13), and pipe plug (12).
12. Install two elbows (11 and 10) and tube assembly (9) (items 75, WP 0047 00).
13. Install bracket (5), two screws (2), lockwashers (3) (tem 26, WP 0062 00), and washers (4).
14. Install fuel coupling (8), spring pin (7), and cotter pin (6).
15. Remove fuel pump (1) from soft-faced vise.

ASSEMBLY – Continued

Suntec Fuel Pump

CAUTION

Do not use Teflon tape-type sealers. The tape can cause damage to the fuel pump and fuel solenoids and may clog the fuel system.

NOTE

Apply sealing compound to all male pipe threads prior to assembly.

1. Place fuel pump (1) into soft-faced vise.
2. Install elbow (23) and straight adapter (24).
3. Install nipple (19), elbow (18), and straight adapter (17).

NOTE

The top fitting on the solenoid valve is an O-ring seal. Hold top fitting with a wrench when installing the nipple.

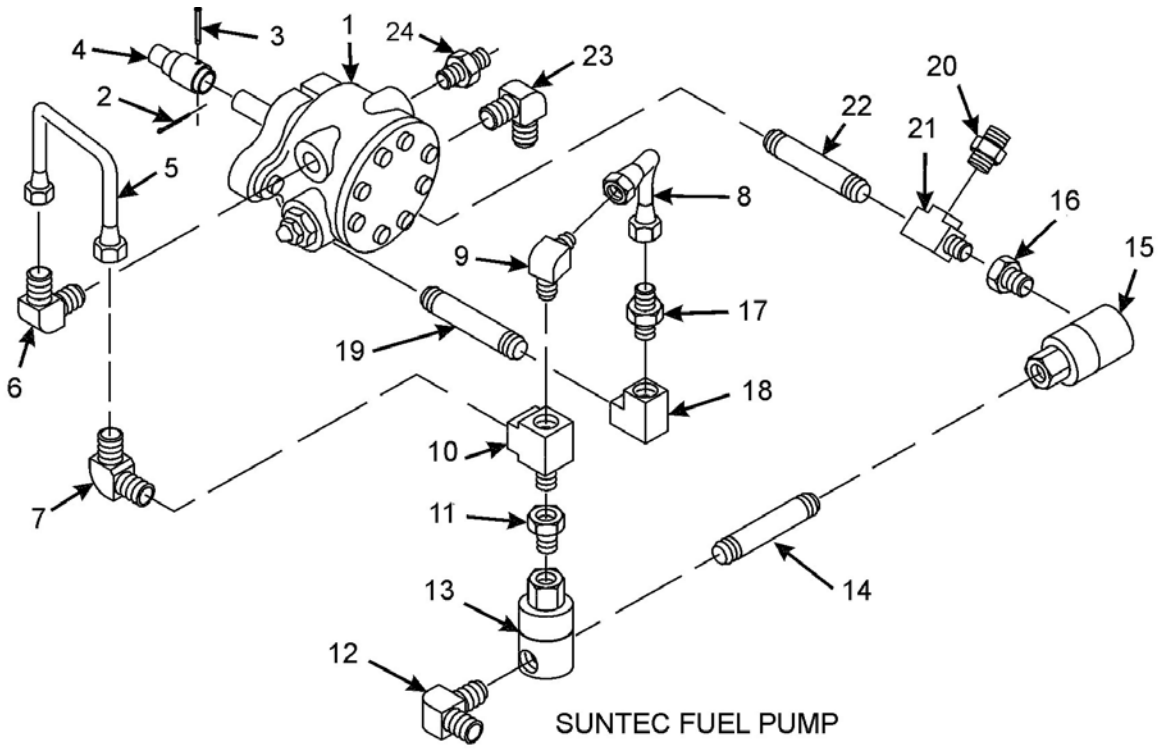
4. Install nipple (22), straight adapter (20), tee (21), pipe bushing (16), and solenoid valve (15).

NOTE

The top fitting on the 3-way solenoid valve is an O-ring seal. Hold top fitting with a wrench when installing the pipe bushing, tee, and elbow.

5. Install nipple (14) and 3-way solenoid valve (13) with port on 3-way solenoid valve marked IN facing nipple.
6. Install elbow (12) to port marked NC on 3-way solenoid valve (13).
7. Install pipe bushing (11), tee (10), elbow (9), and tube assembly (8) (item 76, WP 0047 00).
8. Install two elbows (7 and 6) and tube assembly (5) (item 75, WP 0047 00).
9. Install fuel coupling (4), spring pin (3), and cotter pin (2).
10. Remove fuel pump (1) from soft-faced vise.

ASSEMBLY – Continued



SUNTEC FUEL PUMP

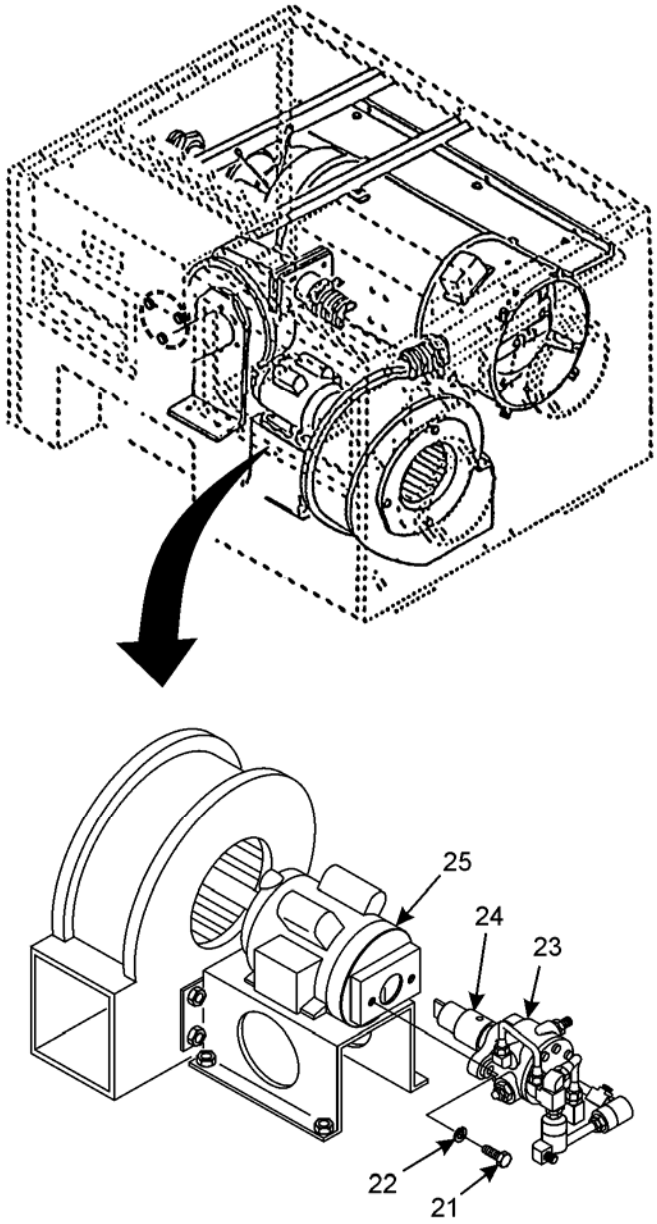
INSTALLATION

1. Apply thread locking sealing compound to two screws (21).

NOTE

Removing handbook compartment may facilitate fuel pump mounting bolt access (WP 0045 00).

2. Aline fuel coupling (24) with slot in motor (25) and install pump assembly (23), two lockwashers (22) (item 30, WP 0062 00), and screws (21). Torque screws to 34 foot-pounds (46 Nm).



INSTALLATION – Continued

3. Connect wire S4-1/L2-BLK (15) (item 60, Table 1, WP 0049 00) and solenoid valve L2 lead (16) with terminal splice (17). Crimp terminal lug (18) onto wire. Remove wire marker tag.

4. Connect wire TB1-8/L1-BLK (10) (item 81, Table 1, WP 0049 00) and solenoid valve L1 lead (11) with terminal splice (12). Crimp terminal lug (13) onto wire. Remove wire marker tag.

5. Crimp terminal lugs (13 and 18) onto two wires TB2-4/L2-BLK (8) and TB2-7/L1-BLK (7). Remove wire marker tags.

6. Route all wires up through conduit (20).

7. Connect wire S4-1/L2-BLK (15) to PURGE SWITCH S4 (19).

8. Connect wire TB1-8/L1-BLK (10) to terminal board TB1 (14).

9. Connect two wires TB2-4/L2-BLK (8) and TB2-7/L1-BLK (7) to terminal board TB2 (9).

10. Install wire ties as required.

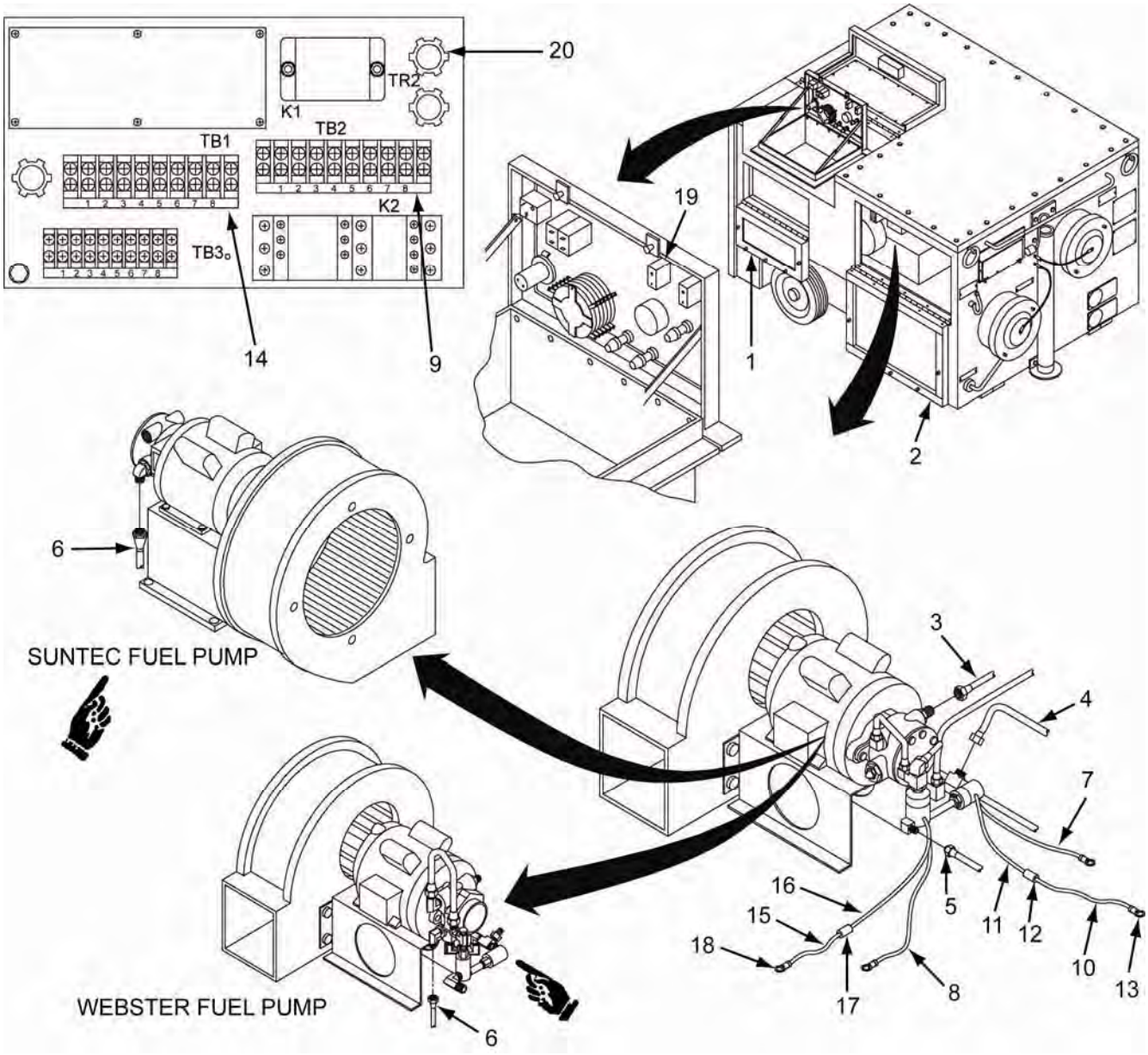
11. Install tube assembly (6).

12. Install tube assemblies (5 and 4) (items 79 and 80, WP 0047 00).

13. Install hose assembly (3).

14. Close control panel, side front door (2), and side rear door (1).

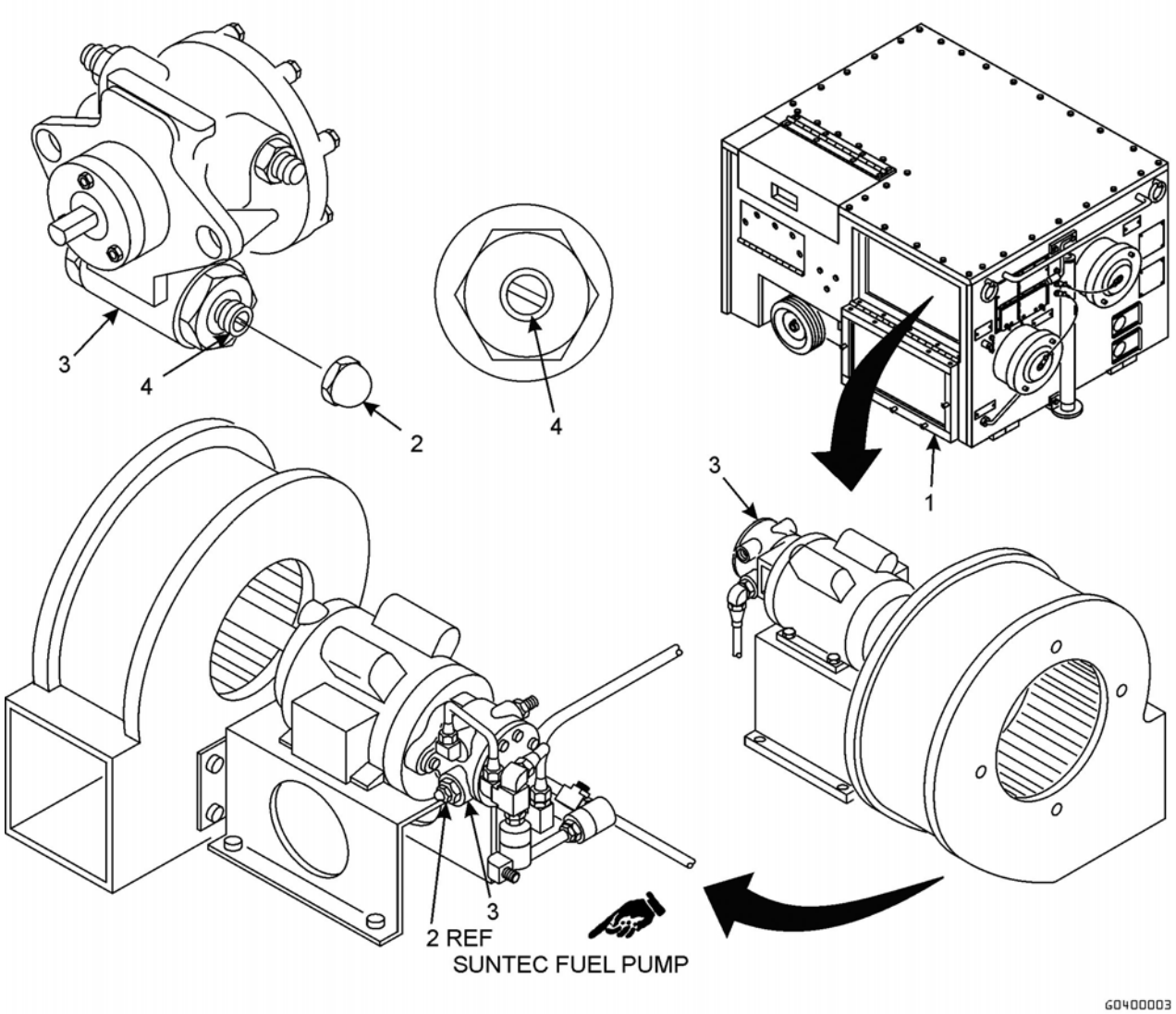
INSTALLATION – Continued



ADJUSTMENT

Suntec Fuel Pump

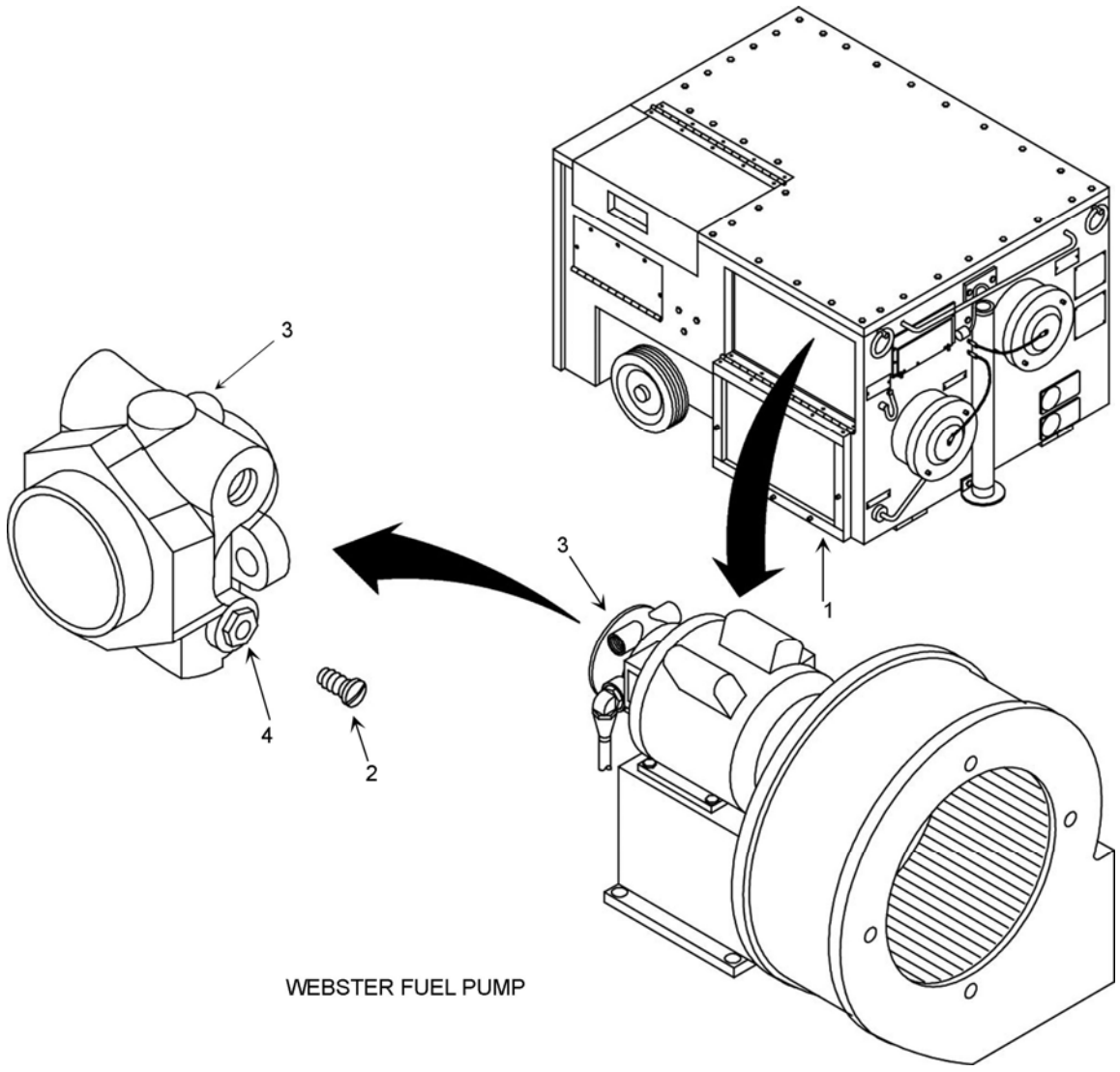
1. Open side front door (1).
2. Remove small hex nut (2) from far side of pump (3).
3. Turn adjustment screw (4) clockwise (in) to increase pump pressure and counterclockwise (out) to decrease pump pressure.
4. Operate IASH (WP 0005 00) and check fuel pressure (WP 0002 00, Table 3).
5. If additional adjustment is necessary, repeat steps 1 thru 4.
6. Install hex nut (2) and close side front door (1).



ADJUSTMENT – Continued

Webster Fuel Pump

1. Open side front door (1).
2. Remove screw (2) from near side of fuel pump.
3. Turn adjustment screw (4) (1/8-inch Allen wrench) clockwise (in) to increase pump pressure and counterclockwise (out) to decrease pump pressure.
4. Operate ASH (WP 0005 00) and check fuel pressure (WP 0002 00, Table 3)
5. If additional adjustment is necessary, repeat steps 1 thru 4 above.
6. Install screw (2) and close side front door (1).



WEBSTER FUEL PUMP

END OF WORK PACKAGE

UNIT MAINTENANCE INSTRUCTIONS

ARMY SPACE HEATER H-140

NSN 4520-01-477-0568

FUEL FILTER
REMOVAL, DISASSEMBLY, INSPECTION, ASSEMBLY, INSTALLATION

INITIAL SETUP:

Test Equipment
None

Tools and Special Tools
Automotive general mechanic's tool kit (item 10, WP 0058 00)
Drain pan (item 6, WP 0058 00)

Personnel Required
One

References
FM 10-67-1

Materials/Parts
Lockwasher (item 29, WP 0062 00)
O-ring (item 37, WP 0062 00)
Sealing compound (item 17, WP 0061 00)
Tube (item 78, WP 0047 00)

Equipment Condition
ASH disconnected from power source (WP 0005 00)
Top panel assembly removed (WP 0021 00)

WARNING

Contact with hot components can cause burns. Allow ASH to cool down before attempting service, inspection, or maintenance activity.

FOR FUEL SPILLS, REFER TO FM 10-67-1, CONCEPTS AND EQUIPMENT OF PETROLEUM OPERATIONS.

Fuel is flammable and toxic to eyes, skin, and respiratory tract. Skin/eye protection is required. Avoid repeated/prolonged contact. Use only in well-ventilated areas. Keep away from open flames or other sources of ignition. Post FUEL FLAMMABLE/NO SMOKING signs around the area. Be sure a fire extinguisher is available.

Fuel on clothing can be fatal if ignited by a static discharge. If fuel gets on clothes, leave the refueling area as soon as possible, remove clothes, and wash skin with warm, soapy water before getting dressed.

Spilled fuel creates a flammable, vapor-air mixture and fire can take place. Improper positioning of external fuel source can cause fuel tank to overflow. Stop refueling immediately if fuel spill occurs.

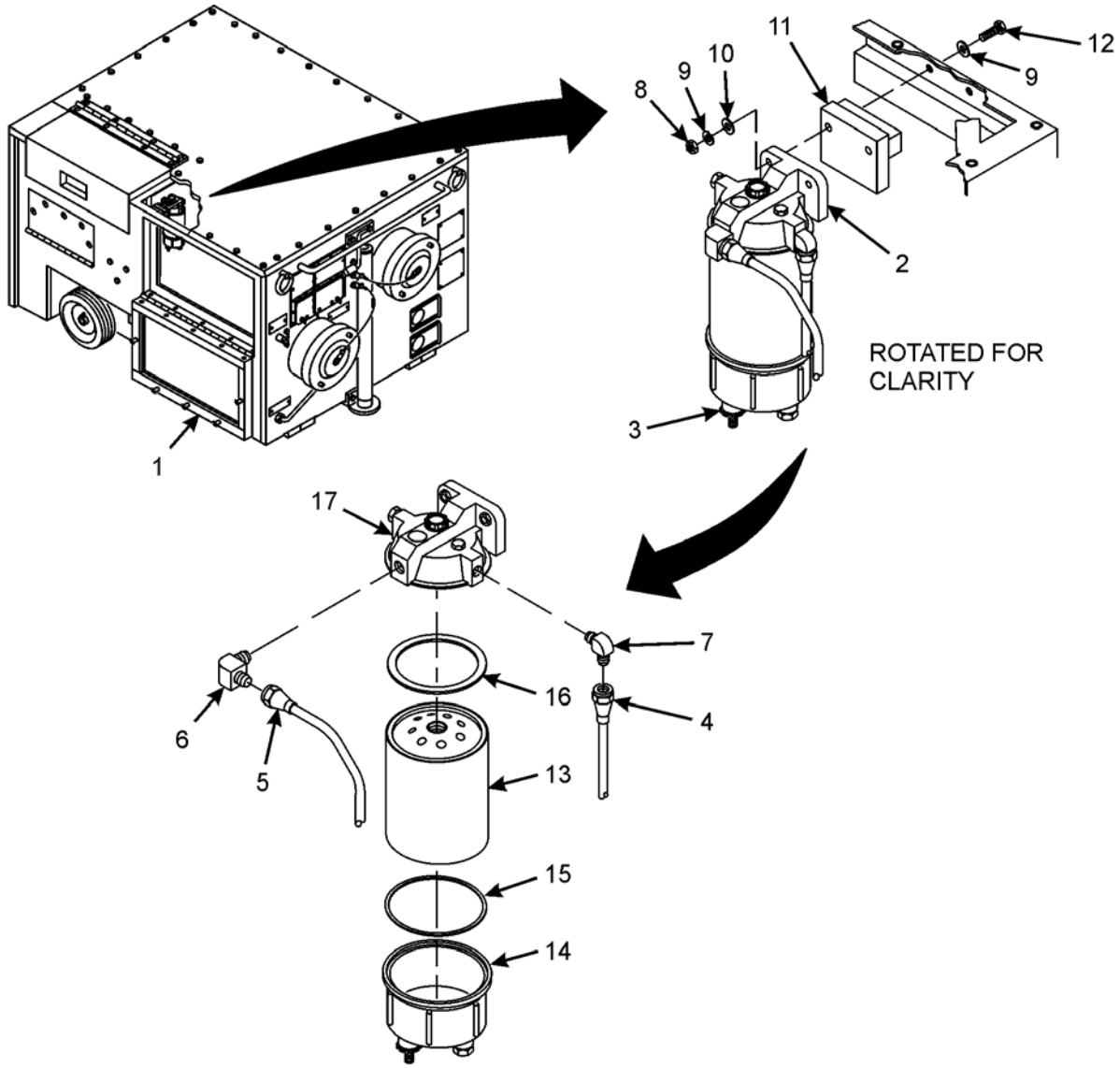
REMOVAL

1. Open side front door (1).
2. Place drain pan under fuel filter (2).
3. Drain fuel from fuel filter (2) by opening drain valve (3).

NOTE

Notice the orientation of the elbows to ensure correct installation.

4. Disconnect hose assembly (4) and tube assembly (5) and remove elbows (6 and 7).
5. Remove two nuts (8), four lockwashers (9), two washers (10), fuel filter (2), mounting plate (11), and two screws (12). Discard lockwashers.



DISASSEMBLY

CAUTION

Do not use tools. Use of tools during disassembly could crack filter bowl causing fuel leaks.

1. Remove filter element (13) and filter bowl (14) as a unit.
2. Remove filter element (13) from filter bowl (14).
3. Remove O-ring (15) from filter bowl (14) and seal (16) from filter head (17). Discard O-ring.

INSPECTION

1. Inspect and clean O-ring gland on filter bowl (14).
2. Inspect tube assemblies (4 and 5) for damage.
3. Inspect filter head (17) for loose or missing hardware, leaks, corrosion, and other damage.

ASSEMBLY

CAUTION

Do not use tools. Use of tools during assembly could crack the filter bowl causing fuel leaks.

1. Apply coating of fuel to seal (16) (part of filter element) and install into filter head (17).
2. Apply coating of fuel to O-ring (15) and install into gland of filter bowl (14).
3. Install filter bowl (14) onto filter element (13). Handtighten only.
4. Install filter element (13) with filter bowl (14) onto filter head (17).

INSTALLATION

1. Install four lockwashers (9), two screws (12), mounting plate (11), two washers (10), and nuts (8).
2. Apply sealing compound to all male threads of elbows (7 and 6).
3. Install elbows (7 and 6) per orientation noted during removal.
4. Connect tube assembly (5) to elbow (6) and connect hose assembly (4) to elbow (7).
5. Close drain valve (3) on fuel filter (2) and close side front door (1).

END OF WORK PACKAGE

UNIT MAINTENANCE INSTRUCTIONS

ARMY SPACE HEATER H-140

NSN 4520-01-477-0568

VENTILATION AIR FAN AND MOTOR ASSEMBLY REMOVAL, INSTALLATION

INITIAL SETUP:

Test Equipment
None

Tools and Special Tools
Automotive general mechanic's tool kit (item 10, WP 0058 00)

Personnel Required
Two

References
None

Materials/Parts
Insulation (item 94, WP 0047 00)
Insulation (item 95, WP 0047 00)

Materials/Parts – Continued
Locknut (34, WP 0062 00)
Lockwasher (item 28, WP 0062 00)
Rubber adhesive (item 1, WP 0061 00)
Thread locking sealing compound (item 20, WP 0061 00)
Wire marker tag (item 25, WP 0061 00)

Equipment Condition
ASH disconnected from power source (WP 0005 00)
Fuel pump and solenoid valves removed (WP 0030 00)
Return air hose assembly removed (WP 0019 00)
Return duct air screen removed (WP 0025 00)
Top panel assembly removed (WP 0021 00)

WARNING

Contact with hot components can cause burns. Allow ASH to cool down before attempting service, inspection, or maintenance activity.

REMOVAL

1. Open side rear door (1) and side front door (2).
2. Remove four locknuts (3), screws (4), and eight washers (5). Discard locknuts.
3. Loosen two setscrews (6) and remove key (7).

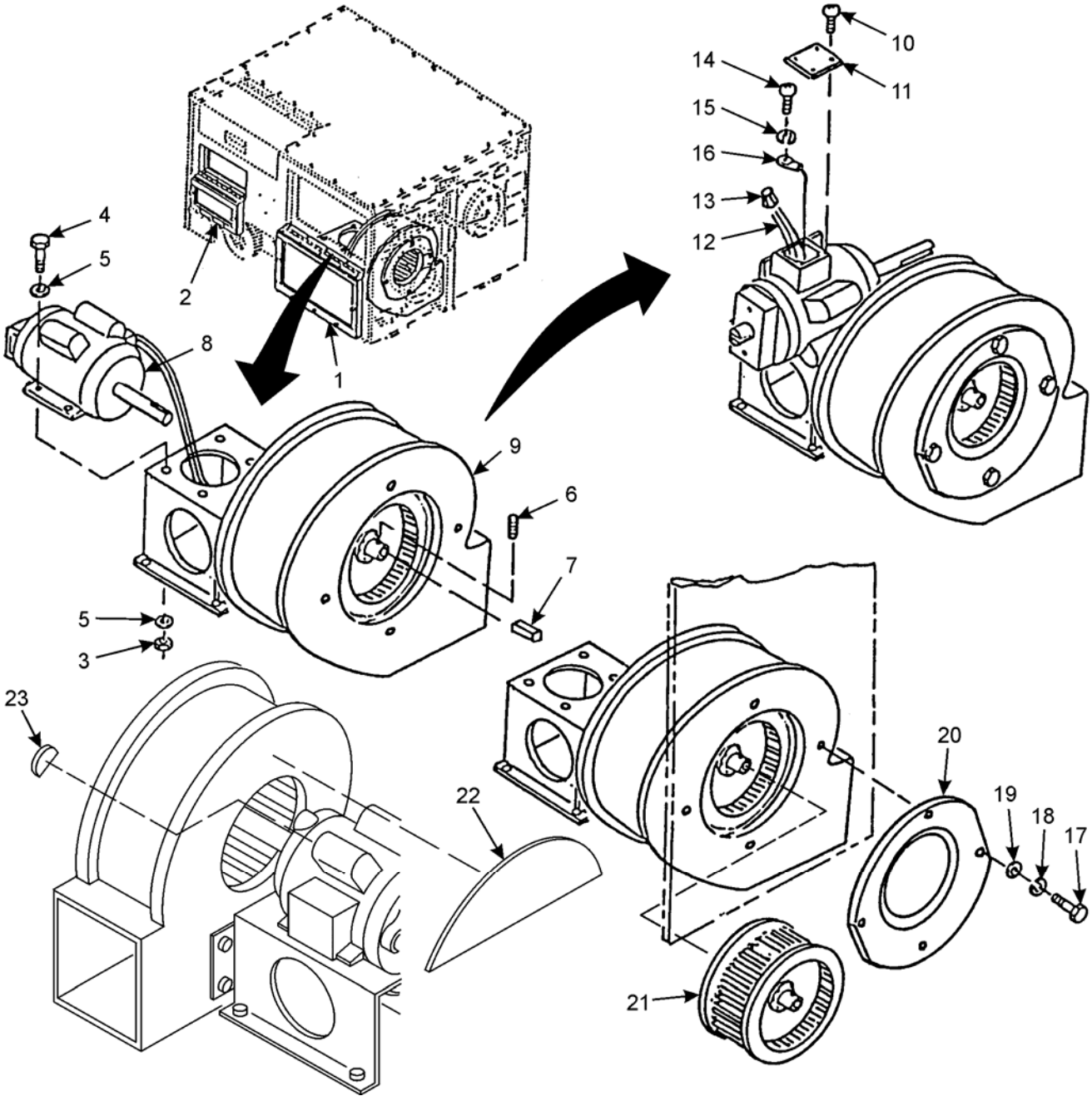
NOTE

Two people are required to remove the motor.

4. Turn motor (8) onto its base and slide motor off of fan assembly (9).
5. Lay motor (8) on its right side with junction box facing up.
6. Remove two screws (10) and cover (11). Gently remove wires (12) from junction box.
7. Tag and disconnect wires (12) and remove two wire nuts (13).
8. Remove two white wires (12) through hole in junction box on motor (8).

REMOVAL – Continued

9. Remove screw (14), lockwasher (15), and ground wire (16).
10. Remove motor (8).
11. Remove four screws (17), lockwashers (18), washers (19), and inlet cone (20). Discard lockwashers.
12. Remove fan assembly (21) through front of ASH.
13. Remove insulation (22) and two pieces of insulation (23).



INSTALLATION

WARNING

Rubber adhesive is flammable. Keep away from open flames or other sources of ignition. Avoid breathing fumes from adhesive. Good general ventilation is normally adequate. Avoid skin contact with adhesive.

1. Apply rubber adhesive to center area of insulation (22 and 23) (items 94 and 95, WP 0047 00) and mating surfaces and install insulation.
2. Install fan assembly (21) through front of ASH.
3. Install inlet cone (20), four washers (19), lockwashers (18), and screws (17).
4. Place motor (8) on its right side with junction box facing up.
5. Route two wires B1-T1, T5↔K2-6 and B1-T4, T8↔K2-2 (12) and B1-GND↔GND (16) through hole in bottom of junction box on side of motor (8).
6. Install wire B1-GND↔GND (16), lockwasher (15), and screw (14). Remove wire marker tag.
7. Remove one wire nut (13) connecting wires T1 and T5. Twist wire B1-T1, T5↔K2-6 (12) with T1 and T5 and install wire nut (13). Remove wire marker tags.
8. Remove other wire nut (13) connecting wires T4 and T8. Twist wire B1-T4, T8↔K2-2 (12) with T4 and T8 and install wire nut (13). Remove wire marker tags.
9. Gently push all wires (12 and 16) into junction box.
10. Install cover (11) and two screws (10).

NOTE

Two people are required to position the motor.

11. Turn motor (8) onto its base and slide motor onto fan assembly (9).
12. Apply thread locking sealing compound to two setscrews (6).
13. Install key (7) and two setscrews (6). Do not tighten.
14. Ensure that fan assembly (9) is pushed back on motor until it stops and tighten two setscrews (6).
15. Install eight washers (5), four screws (4), and locknuts (3). Handtighten hardware.
16. Turn fan assembly (21) by hand. If fan turns freely without rubbing, tighten hardware installed in step 14. If fan rubs, re-aline motor (8) until fan turns freely and tighten hardware installed in step 14.
17. Close side front door (2) and side rear door (1).

END OF WORK PACKAGE

UNIT MAINTENANCE INSTRUCTIONS

ARMY SPACE HEATER H-140

NSN 4520-01-477-0568

COMBUSTION AIR FAN ASSEMBLY
REMOVAL, DISASSEMBLY, INSPECTION, REPAIR, ASSEMBLY, INSTALLATION

INITIAL SETUP:

Test Equipment
None

Tools and Special Tools
Automotive general mechanic's tool kit (item 10, WP 0058 00)
Gasket punch (item 6, WP 0058 00)
Shears (item 6, WP 0058 00)

Personnel Required
One

References
None

Materials/Parts
Gasket (item 72, WP 0047 00)
Lockwasher (item 28, WP 0062 00)
Wire marker tag (item 25, WP 0061 00)
Wire tie (item 24, WP 0061 00)

Equipment Condition
ASH disconnected from power source (WP 0005 00)
Top panel assembly removed (WP 0021 00)

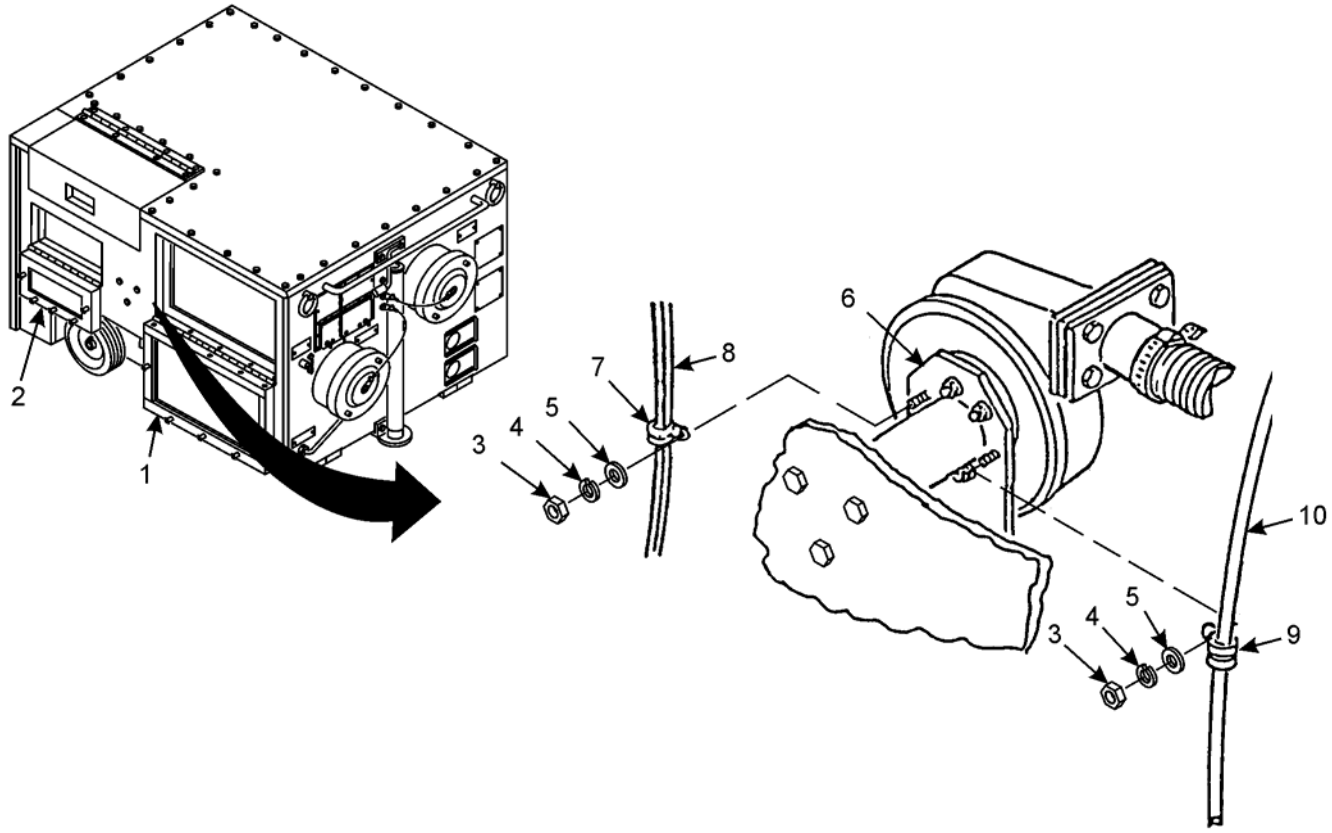
WARNING

Contact with hot components can cause burns. Allow ASH to cool down before attempting service, inspection, or maintenance activity.

REMOVAL

1. Open side front door (1) and side rear door (2).
2. Remove two nuts (3), lockwashers (4), and washers (5) from 3 o'clock and 9 o'clock positions on fan mount bracket (6). Discard lockwashers.
3. Remove clamp (7) wire bundle (8), clamp (9), and fuel line (10).
4. Cut wire ties as required.

REMOVAL – Continued



REMOVAL – Continued

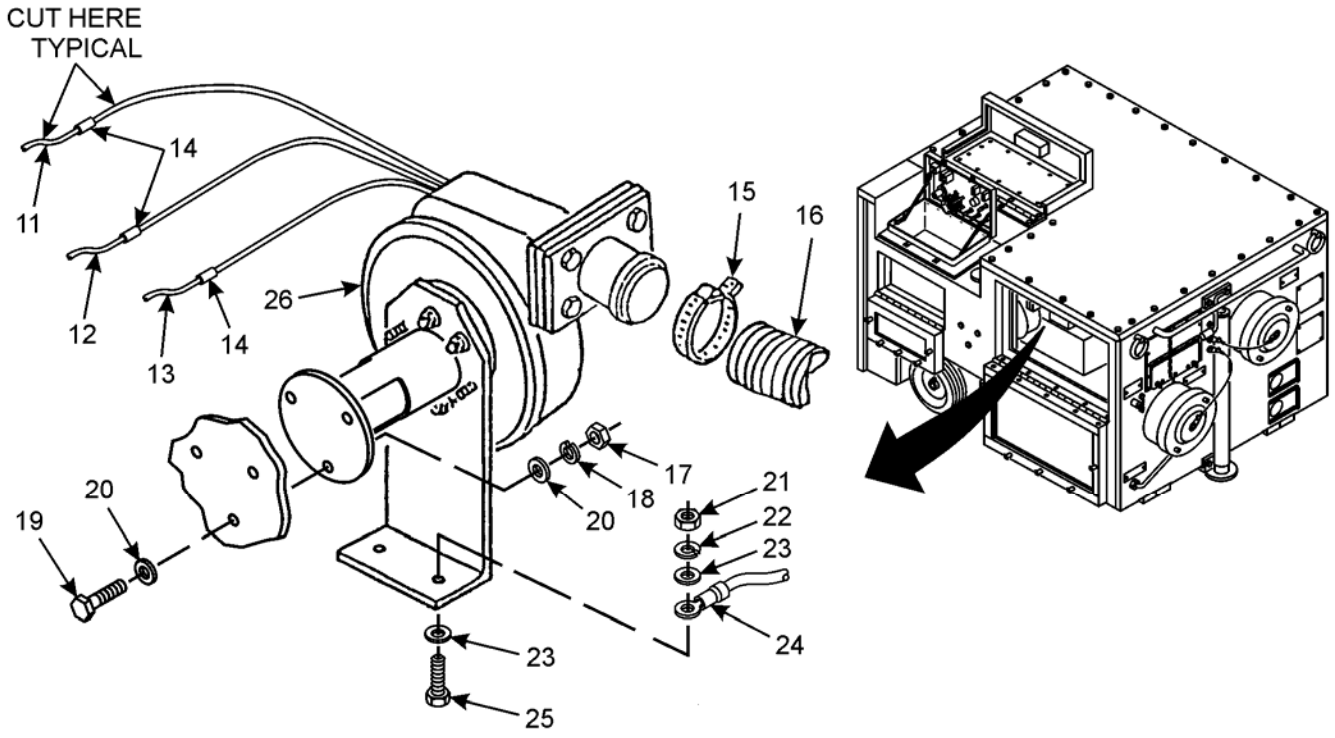
4. Tag and cut black wire TB1-7/B2-BLK (11), white wire TB2-5/B2-WHT (12), and green wire GND/B2-GRN (13) and remove terminal splices (14).

5. Loosen clamp (15) and disconnect air hose (16) and clamp.

6. Remove three nuts (17), lockwashers (18), screws (19), and six washers (20). Discard lockwashers.

7. Remove two nuts (21), two lockwashers (22), four washers (23), ground wire (24), and two screws (25). Discard lockwashers.

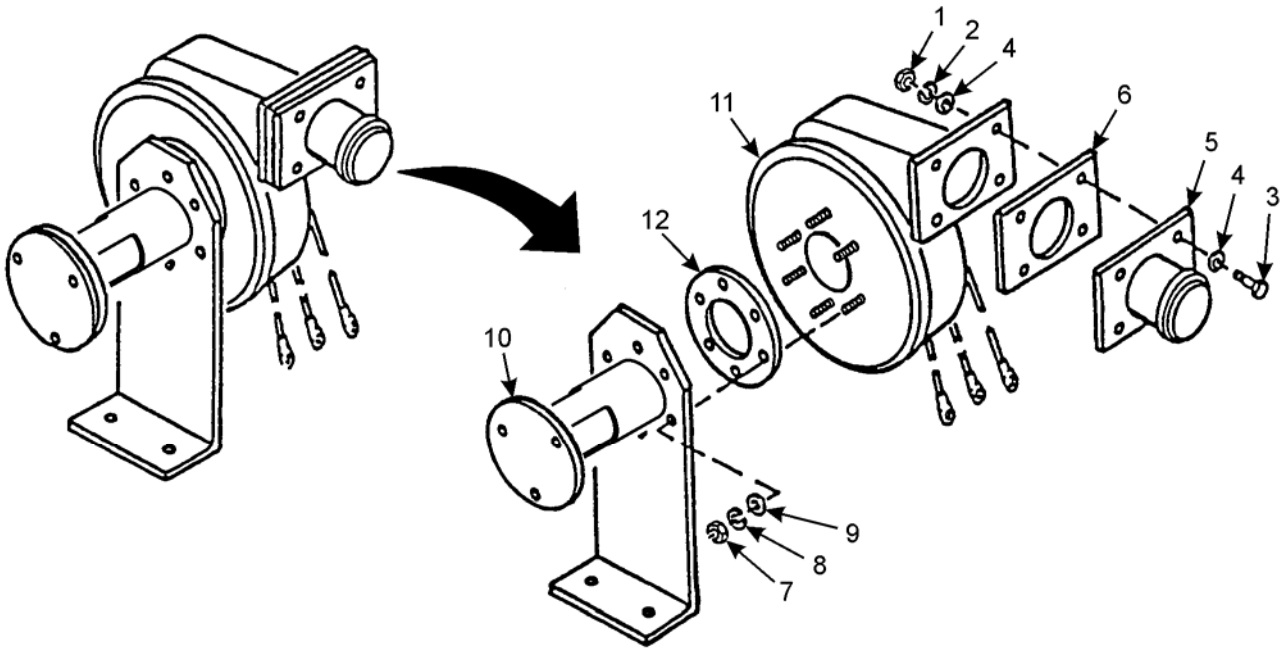
8. Remove fan assembly (26).



DISASSEMBLY

1. Remove four nuts (1), lockwashers (2), screws (3), eight washers (4), adapter (5), and gasket (6). Discard lockwashers.

2. Remove remaining four nuts (7), lockwashers (8), washers (9), fan mount bracket (10), fan assembly (11), and gasket (12). Discard lockwashers.



INSPECTION

Inspect parts for wear, cracks, and other damage.

REPAIR

Repair is limited to replacement of defective parts.

ASSEMBLY

1. Install gasket (12) on fan assembly (11).

2. Position fan assembly (11) on fan mount bracket (10).

NOTE

Leave the 3 o'clock and 9 o'clock positions empty.

3. Install four washers (9), lockwashers (8), and nuts (7).

4. Position gasket (6) and adapter (5) onto fan assembly (11) and secure with eight washers (4), four screws (3), lockwashers (2), and nuts (1).

INSTALLATION

1. Install fan assembly (26), two screws (25), ground wire (24), four washers (23), two lockwashers (22), and two nuts (21). Handtighten only.

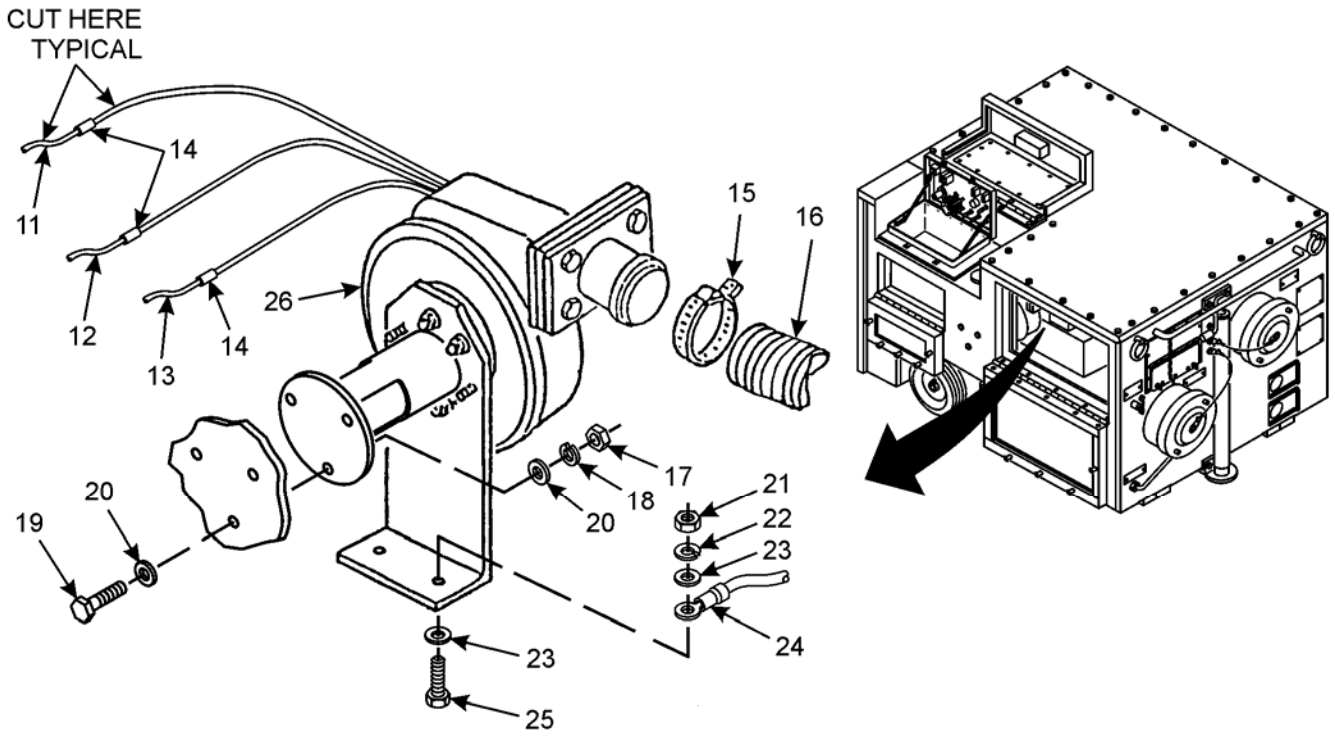
2. Loosely install six washers (20), three screws (19), lockwashers (18), and nuts (17).

3. Tighten hardware installed in step 1.

4. Install air hose (16) and clamp (15).

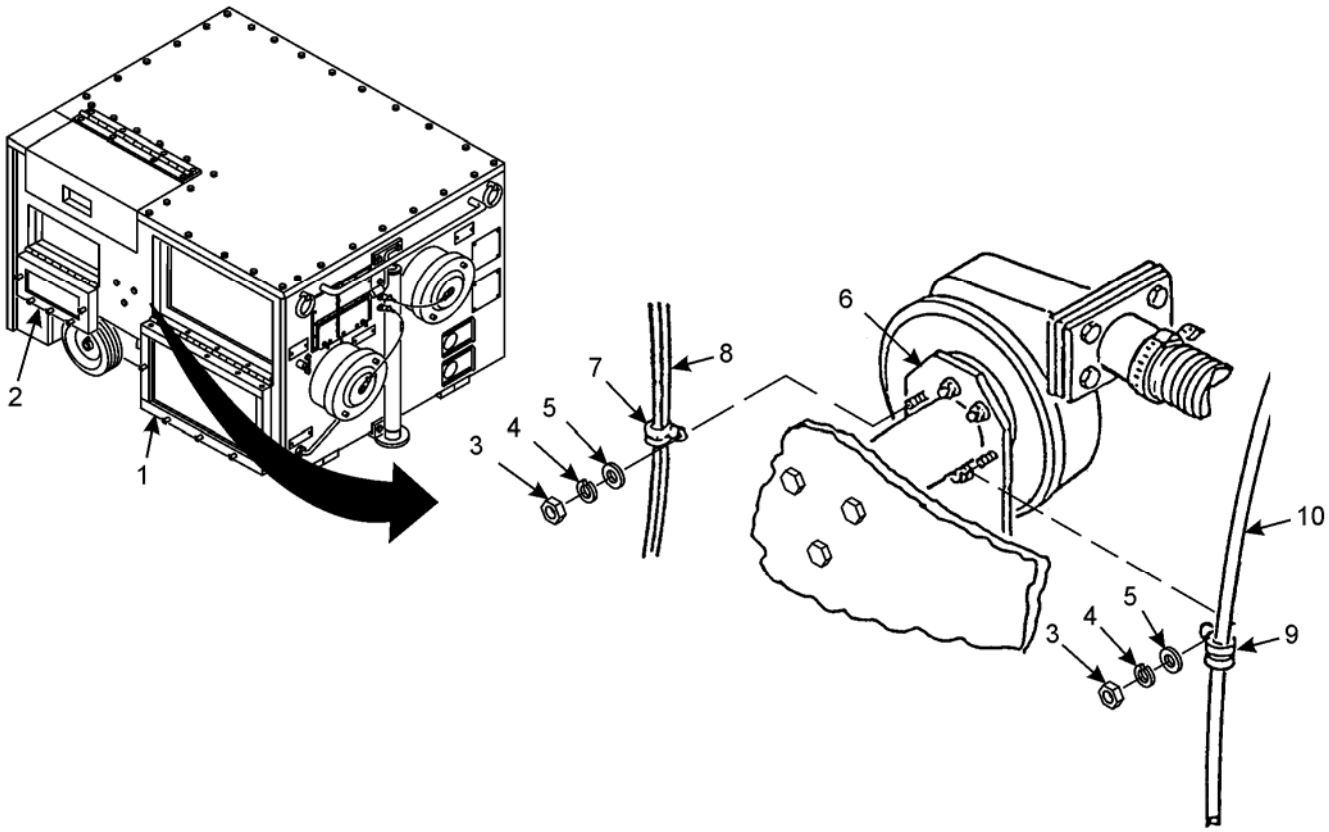
5. Connect terminal splices (14) to green wire GND/B2-GRN (13), white wire TB2-5/B2-WHT (12), and black wire TB1-7/B2-BLK (11). Remove wire marker tags.

6. Install wire ties as required.



INSTALLATION – Continued

9. Install fuel line (10) and clamp (9) onto fan mount bracket (6) at 3 o'clock position.
10. Install wire bundle (8) and clamp (7) onto fan mount bracket (6) at 9 o'clock position.
11. Install two washers (5), lockwashers (4), and nuts (3).
12. Close side rear door (2) and side front door (1).



END OF WORK PACKAGE

UNIT MAINTENANCE INSTRUCTIONS

ARMY SPACE HEATER H-140

NSN 4520-01-477-0568

THERMOSTAT ASSEMBLY REMOVAL, DISASSEMBLY, REPAIR, ASSEMBLY, INSTALLATION

INITIAL SETUP:

Test Equipment
None

Tools and Special Tools
Automotive general mechanic's tool kit (item 10, WP 0058 00)
Electrical repair shop set (item 8, WP 0058 00)

Personnel Required
One

References
None

Materials/Parts
Lockwasher (item 23, WP 0062 00)
Lockwasher (item 26, WP 0062 00)
Lockwasher (item 33, WP 0062 00)
Wire harness (item 69, WP 0047 00)
Wire marker tag (item 25, WP 0061 00)
Wire tie (item 24, WP 0061 00)

Equipment Condition
ASH disconnected from power source (WP 0005 00)
Supply air hose assembly removed (WP 0019 00)
Supply duct air screen removed (WP 0025 00)

WARNING

Contact with hot components can cause burns. Allow ASH to cool down before attempting service, inspection, or maintenance activity.

REMOVAL

1. Open right rear side door (1).

2. Tag and disconnect following wires (2 thru 6) from terminal board TB1 (7) and terminal board TB3 (8), MODE SWITCH S1 (9), and HIGH TEMP indicator DS2 (10).

   S2-1↔TB1-5 from TB1-5
   S2-3↔TB1-8 from TB1-8
   S3-1↔TB3-3 from TB3-3
   S3-3↔ S1-51 from S1-51
   S2-2↔ DS2 from DS2

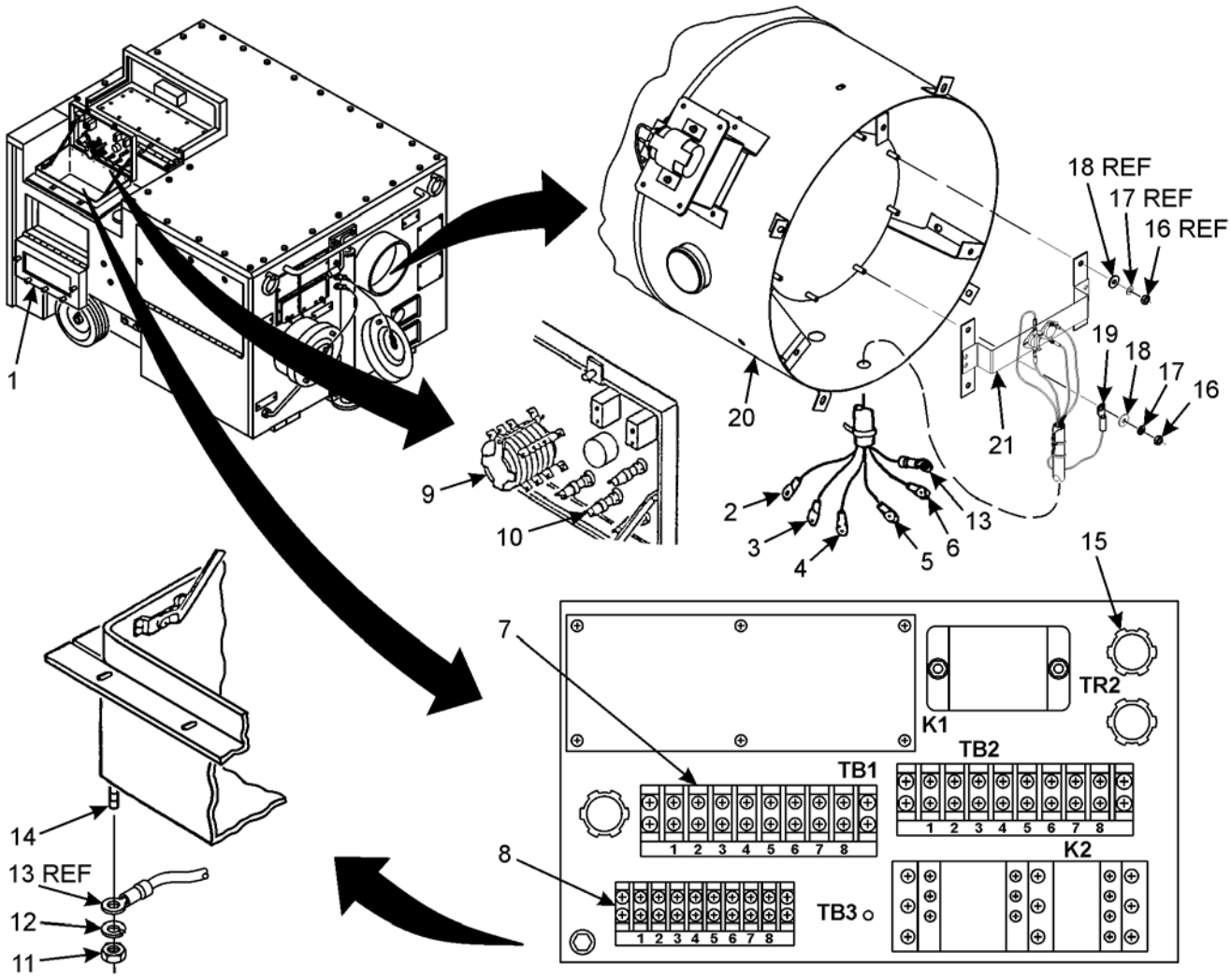
3. Reconnect all other wires.

4. Remove nut (11), lockwasher (12), and braided wire (13) from ground stud (14). Discard lockwasher.

5. Cut wire ties as required.

REMOVAL – Continued

6. Guide wires (2 thru 6) down through conduit (15).
7. Remove nut (16), lockwasher (17), washer (18), and braided wire (19). Discard lockwashers.
8. Remove wires (2 thru 6) from heat exchanger shell (20).
9. Remove four nuts (16), lockwashers (17), washers (18), and thermostat bracket assembly (21). Discard lockwashers.

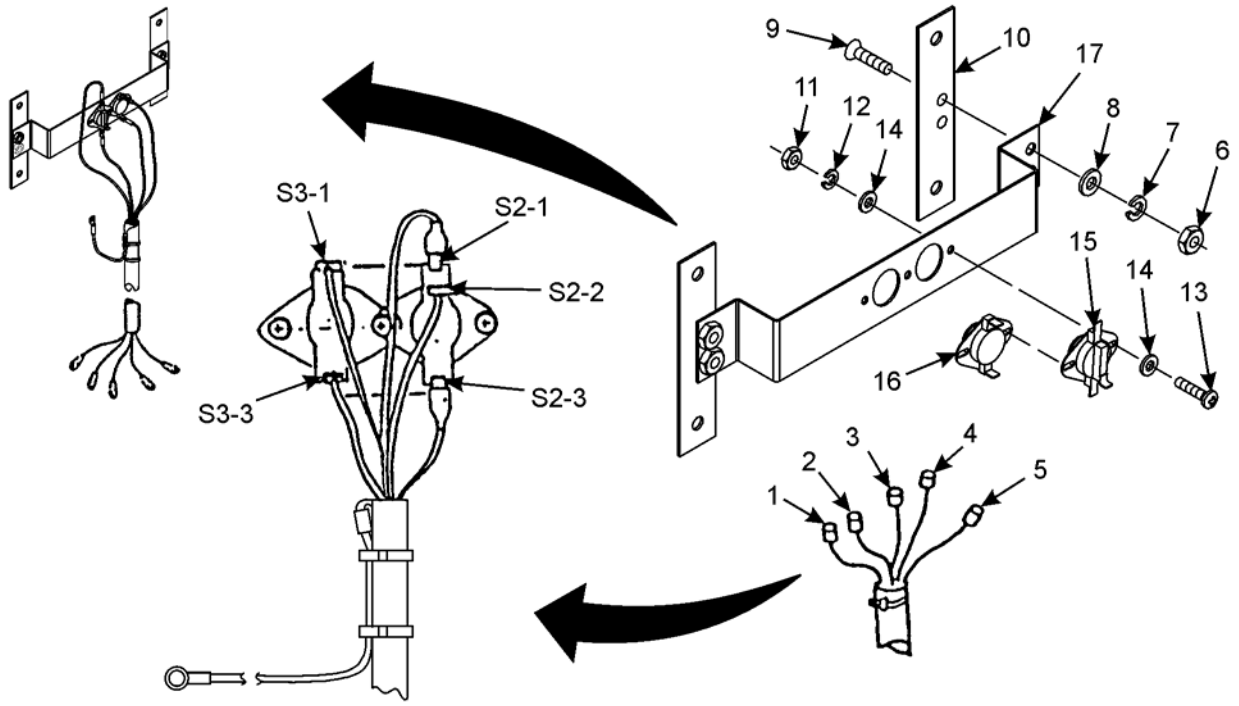


DISASSEMBLY

1. Tag and disconnect wires (1 thru 5) from overheat thermostat S2 and discharge air thermostat S3.

2. Remove two nuts (6), lockwashers (7), washers (8), screws (9), and brackets (10). Discard lockwashers.

3. Remove three nuts (11), lockwashers (12), screws (13) six washers (14), overheat thermostat (15), and discharge air thermostat (16) from thermostat bracket (17). Discard lockwashers.



REPAIR

1. Repair is limited to replacement of defective parts.

2. If wire harness is damaged, repair/replace wire harness.

ASSEMBLY

1. Install discharge air thermostat S3(16) and overheat thermostat S2 (15) with terminal S3-1 and S2-1, respectively, toward top of thermostat bracket (17).

2. Install six washers (14), three screws (13), lockwashers (12) (item 26, WP 0062 00), and nuts (11).

3. Install two brackets (10), screws (9), washers (8), lockwashers (7) (item 33, WP 0062 00), and nuts (6).

4. Connect quick-disconnect end of wires (5 thru 1) to discharge air thermostat S3 and overheat thermostat S2. Remove wire marker tags.

   S2-2↔DS2 to S2-2
   S3-3↔S1-51 to S3-3
   S3-1↔TB3-3 to S3-1
   S2-3↔TB1-8 to S2-3
   S2-1↔TB1-5 to S2-1

INSTALLATION

1. Install wires (6 thru 2) through heat exchanger shell (20) and route toward conduit (15).

2. Install thermostat bracket assembly (21), four washers (18), lockwashers (17) (item 33, WP 0062 00), and nuts (16).

3. Install braided wire (19), washer (18), lockwasher (17) (item 33, WP 0062 00), and nut (16).

4. Route wires (6 thru 2) up through conduit (15).

5. Connect following wires (6 thru 2) to DS2 (10), MODE SWITCH S1 (9), and terminal board TB3 (8) and terminal board TB1 (7). Remove wire marker tags.

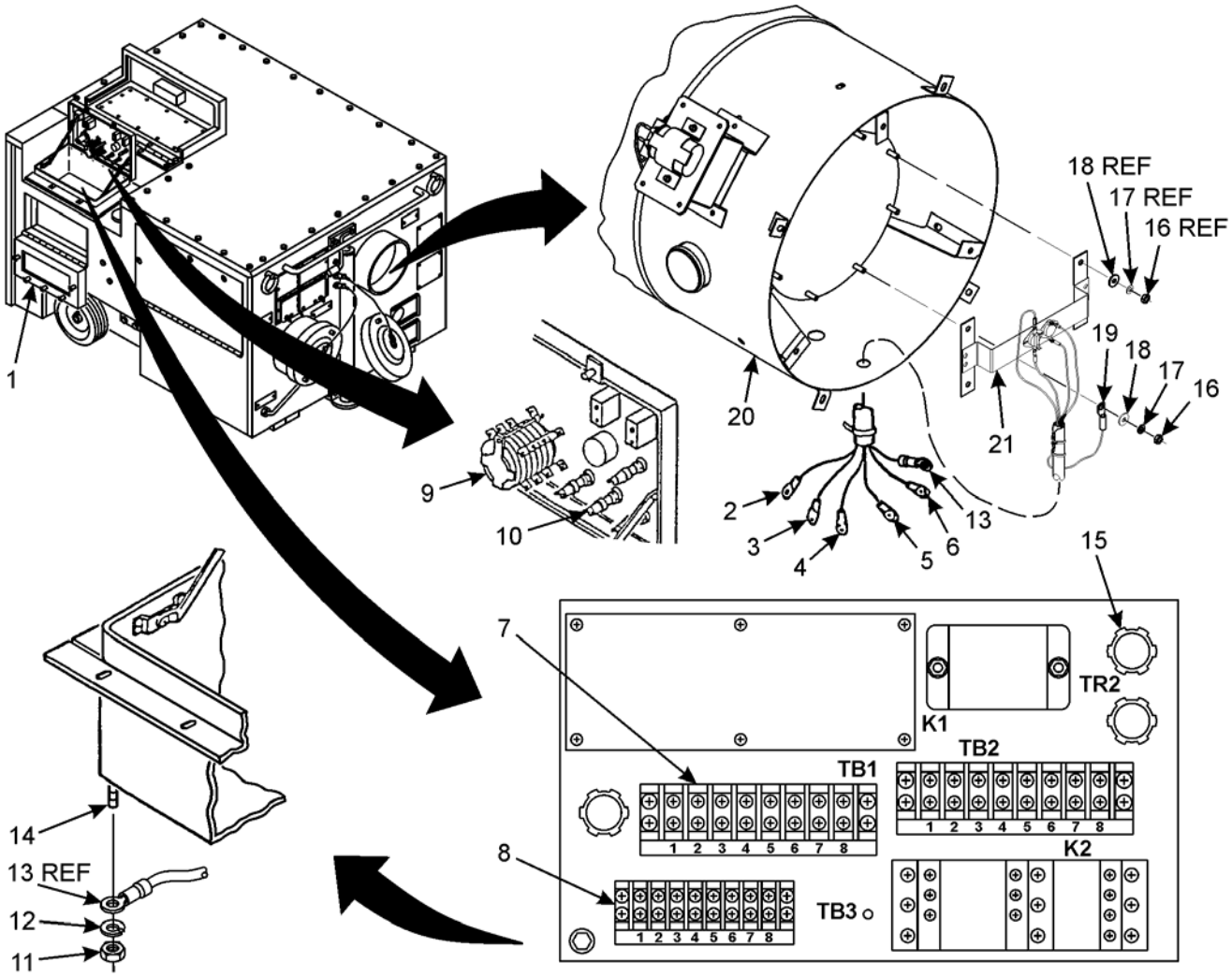
   S2-2↔DS2 to DS2
   S3-3↔S1-51 to S1-51
   S3-1↔TB3-3 to TB3-3
   S2-3↔TB1-8 to TB1-8
   S2-1↔TB1-5 to TB1-5

6. Install ground wire (13), lockwasher (12) (item 23, WP 0062 00), and nut (11) onto braided stud (14).

7. Install wire ties as required.

8. Close right rear side door (1).

INSTALLATION – Continued



END OF WORK PACKAGE

UNIT MAINTENANCE INSTRUCTIONS

ARMY SPACE HEATER H-140

NSN 4520-01-477-0568

IGNITION TRANSFORMER ASSEMBLY
REMOVAL, DISASSEMBLY, REPAIR, ASSEMBLY, INSTALLATION

INITIAL SETUP:

Test Equipment
None

Tools and Special Tools
Automotive general mechanic's tool kit (item 10, WP 0058 00)
Drill (item 6, WP 0058 00)
Drill bit (item 6, WP 0058 00)
Electrical repair shop set (item 8, WP 0058 00)
Heat gun (item 8, WP 0058 00)
Rivnut tool (item 3, WP 0058 00)

Personnel Required
One

References
None

Materials/Parts
Braided shield (item 89, WP 0047 00)
Gasket (item 88, WP 0047 00)
Gasket (item 90, WP 0047 00)
Gasket (item 91, WP 0047 00)
Gasket (item 92, WP 0047 00)
Insulation sleeving (item 22, WP 0061 00)
Lockwasher (item 22, WP 0062 00)
Lockwasher (item 27, WP 0062 00)
Lockwasher (item 33, WP 0062 00)
Rivnut (item 12, WP 0062 00)
Wire marker tag (item 25, WP 0061 00)
Wire tie (item 24, WP 0061 00)

Equipment Condition
ASH disconnected from power source (WP 0005 00)
Supply duct air screen removed (WP 0025 00)
Supply duct cover assembly removed (WP 0024 00)
Top panel assembly removed (WP 0021 00)

WARNING

Contact with hot components can cause burns. Allow ASH to cool down before attempting service, inspection, or maintenance activity.

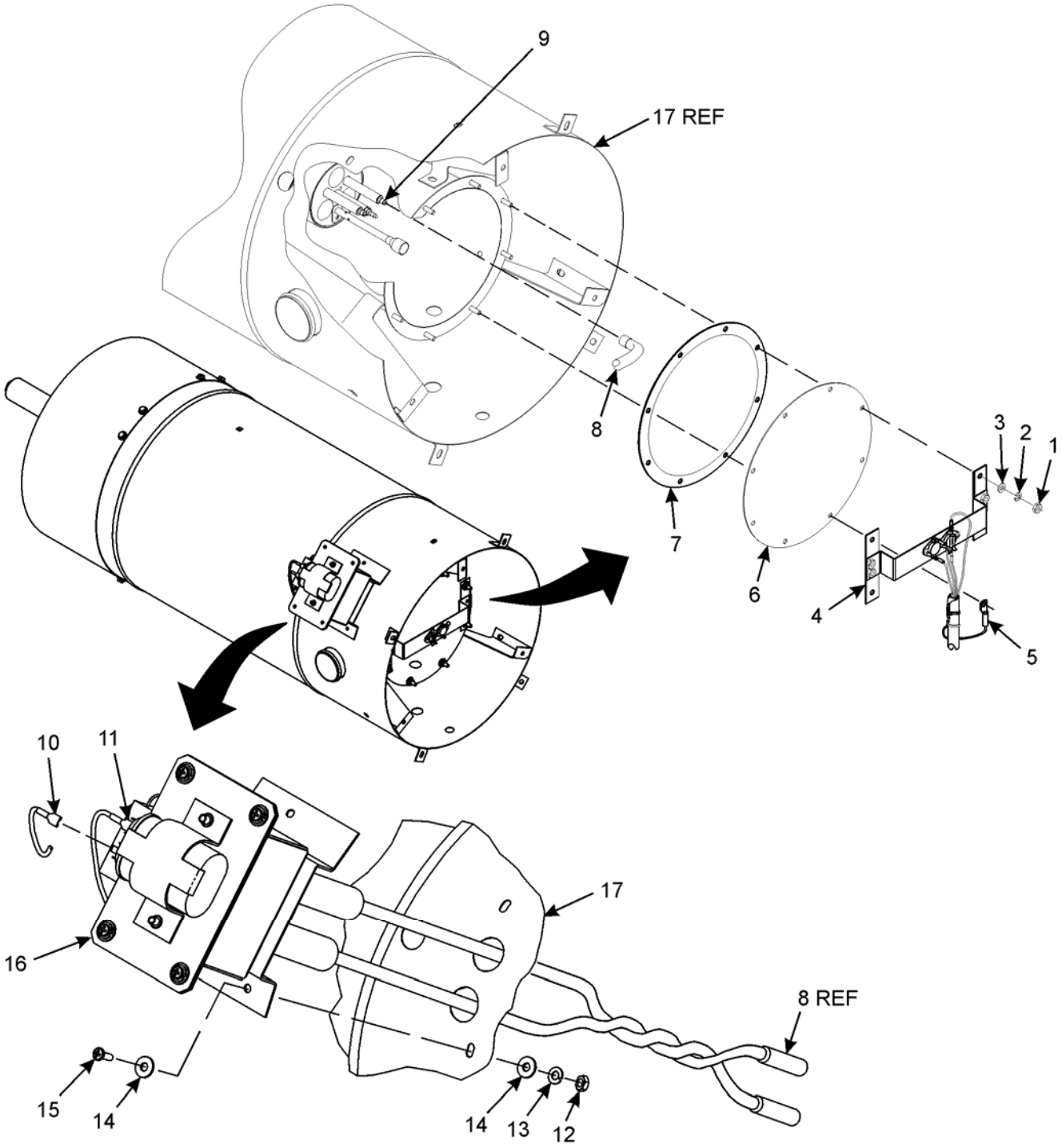
REMOVAL

1. Remove eight nuts (1), lockwashers (2), washers (3), thermostat bracket assembly (4), braided wire (5), and cover plate (6). Discard lockwashers.
2. Remove gasket (7) from cover plate (6).
3. Disconnect two high-tension leads (8) from electrodes (9).
4. Cut wire ties as required.
5. Tag and disconnect two wires (10) from capacitor (11).

REMOVAL – Continued

6. Remove two nuts (12), two lockwashers (13), four washers (14), and two screws (15). Discard lockwashers.

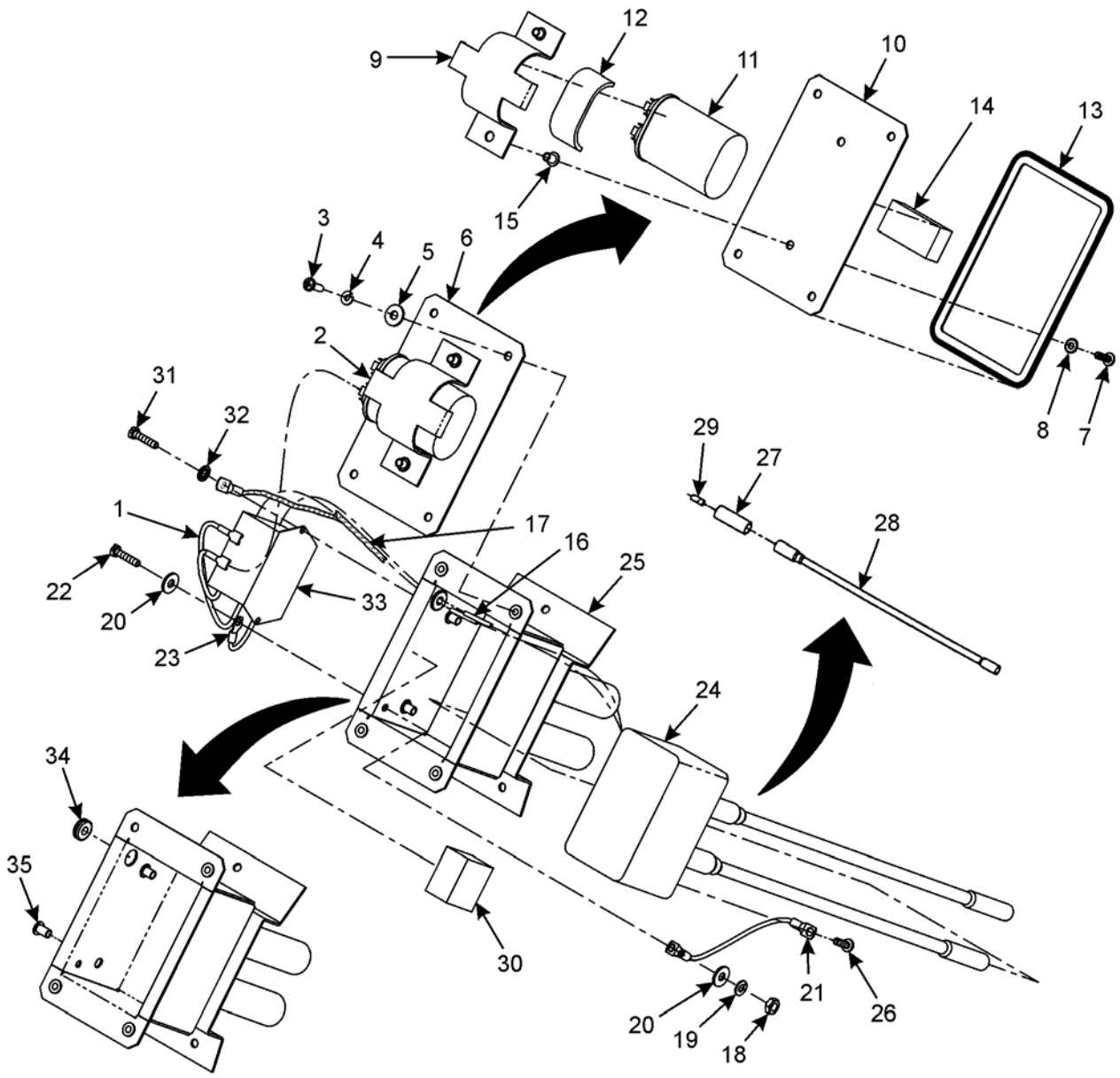
7. Untwist and carefully guide two high-tension leads (8) and remove ignition transformer assembly (16) from heat exchanger shell (17).



DISASSEMBLY

1. Tag and disconnect two wires (1) from capacitor (2).
2. Remove four screws (3), lockwashers (4), washers (5), and capacitor assembly (6). Discard lockwashers.
3. Remove two screws (7), lockwashers (8), and bracket (9) from lid (10). Discard lockwashers.
4. Remove capacitor (11) and gasket (12).
5. Remove EMI gasket (13) and gasket (14) from lid (10).
6. Drill out two rivnuts (15) from bracket (9).
7. Tag two wires and cut away wire splices (16).
8. Remove two braided shields (17) from wires as shown.
9. Remove nut (18), lockwasher (19), two washers (20), ground wire (21), screw (22), and ground wire (23).
10. Remove ignition transformer (24) from mounting plate (25).
11. Remove screw (26) and ground wire (21) from ignition transformer (24).
12. Cut away two insulation sleevings (27) and remove high-tension leads (28) from ignition transformer (24).
13. Remove two hollow studs (29) from high-tension leads (28).
14. Remove gasket (30) from mounting plate (25).
15. Remove two screws (31), lockwashers (32), braided shield (17), and Radio Frequency (RF) filter (33).
16. Remove grommet (34) from mounting plate (25).
17. Drill out six rivnuts (35) from mounting plate (25).

DISASSEMBLY – Continued



REPAIR

Repair is limited to replacement of defective parts.

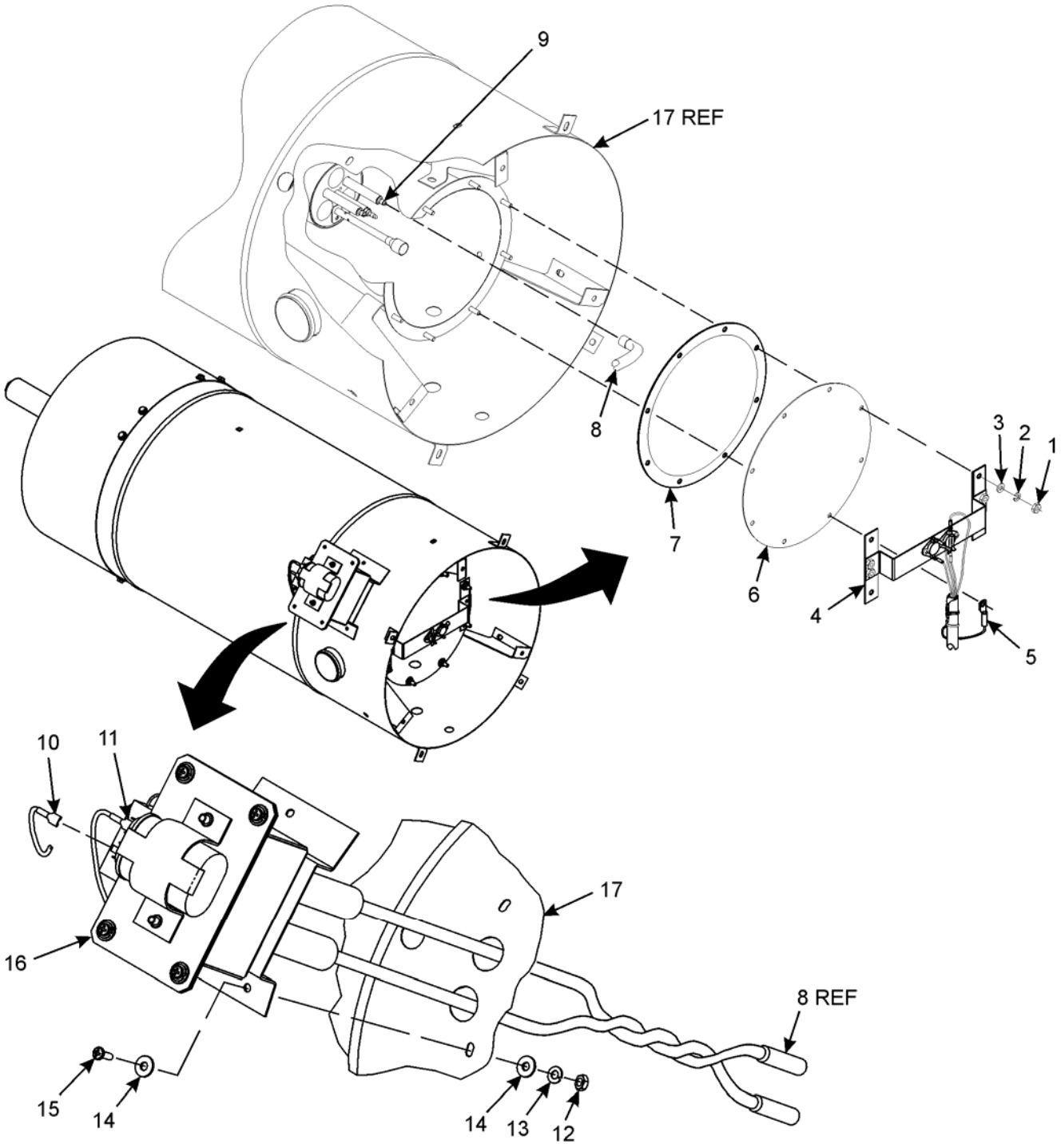
ASSEMBLY

1. Install six rivnuts (35) onto mounting plate (25).
2. Install grommet (34) onto mounting plate (25).
3. Install RF filter (33), braided shield (17), two lockwashers (32) (item 22, WP 0062 00), and screws (31).
4. Install gasket (30) (item 88, WP 0047 00) onto mounting plate (25).
5. Install two hollow studs (29) onto high-tension leads (28).
6. Slide two insulation sleevings (27) over high-tension leads (28) and install high-tension leads onto ignition transformer (24).
7. Position and secure insulation sleevings (27) over high-tension leads (28) and ignition transformer (24).
8. Install ground wire (21) and screw (26) onto ignition transformer (24).
9. Install ignition transformer (24) into mounting plate (25).
10. Install ground wire (23), screw (22), ground wire (21), two washers (20), lockwasher (19) (item 27, WP 0062 00), and nut (18).
11. Install two braided shields (17) (item 89, WP 0047 00) onto wires as shown.
12. Connect two wires with wire splices (16). Remove wire marker tags.
13. Install two rivnuts (15) onto bracket (9).
14. Install gasket (14) (item 91, WP 0047 00) and EMI gasket (13) (item 92, WP 0047 00) onto lid (10).
15. Install gasket (12) (item 90, WP 0047 00), capacitor (11), bracket (9), two lockwashers (8) (item 22, WP 0062 00), and screws (7) onto lid (10).
16. Install capacitor assembly (6), four washers (5), lockwashers (4) (item 27, WP 0062 00), and screws (3).
17. Connect two wires (1) onto capacitor (2). Remove wire marker tags.

INSTALLATION

1. Carefully guide two high-tension leads (8) into heat exchanger shell (17) and install ignition transformer assembly (16).
2. Position ignition transformer assembly (16) and install with two screws (15), four washers (14), two lockwashers (13) (item 27, WP 0062 00), and two nuts (12).
3. Connect two wires (10) onto capacitor (11). Remove wire marker tags.
4. Install wire ties as required.
5. Twist two high-tension leads (8) together three turns and connect to electrodes (9).
6. Install gasket (7) onto cover plate (6).
7. Install cover plate (6), braided wire (5), thermostat bracket assembly (4), eight washers (3), lockwashers (2) (item 33, WP 0062 00), and nuts (1).

INSTALLATION – Continued



END OF WORK PACKAGE

UNIT MAINTENANCE INSTRUCTIONS

ARMY SPACE HEATER H-140

NSN 4520-01-477-0568

BURNER ASSEMBLY
REMOVAL, INSPECTION, REPAIR, INSTALLATION

INITIAL SETUP:

Test Equipment
None

Tools and Special Tools
Automotive general mechanic's tool kit (item 10, WP 0058 00)

Personnel Required
One

References
FM 10-67-1

Materials/Parts
Cleaning compound solvent (item 3, WP 0061 00)
Lockwasher (item 33, WP 0062 00)
Sealing compound (item 17, WP 0061 00)
Wiping rag (item 14, WP 0061 00)

Equipment Condition
ASH disconnected from power source (WP 0005 00)
Supply duct air screen removed (WP 0025 00)
Supply duct cover assembly removed (WP 0024 00)

WARNING

Contact with hot components can cause burns. Allow ASH to cool down before attempting service, inspection, or maintenance activity.

FOR FUEL SPILLS, REFER TO FM 10-67-1, CONCEPTS AND EQUIPMENT OF PETROLEUM OPERATIONS.

Fuel is flammable and toxic to eyes, skin, and respiratory tract. Skin/eye protection is required. Avoid repeated/prolonged contact. Use only in well-ventilated areas. Keep away from open flames or other sources of ignition. Post FUEL FLAMMABLE/NO SMOKING signs around the area. Be sure a fire extinguisher is available.

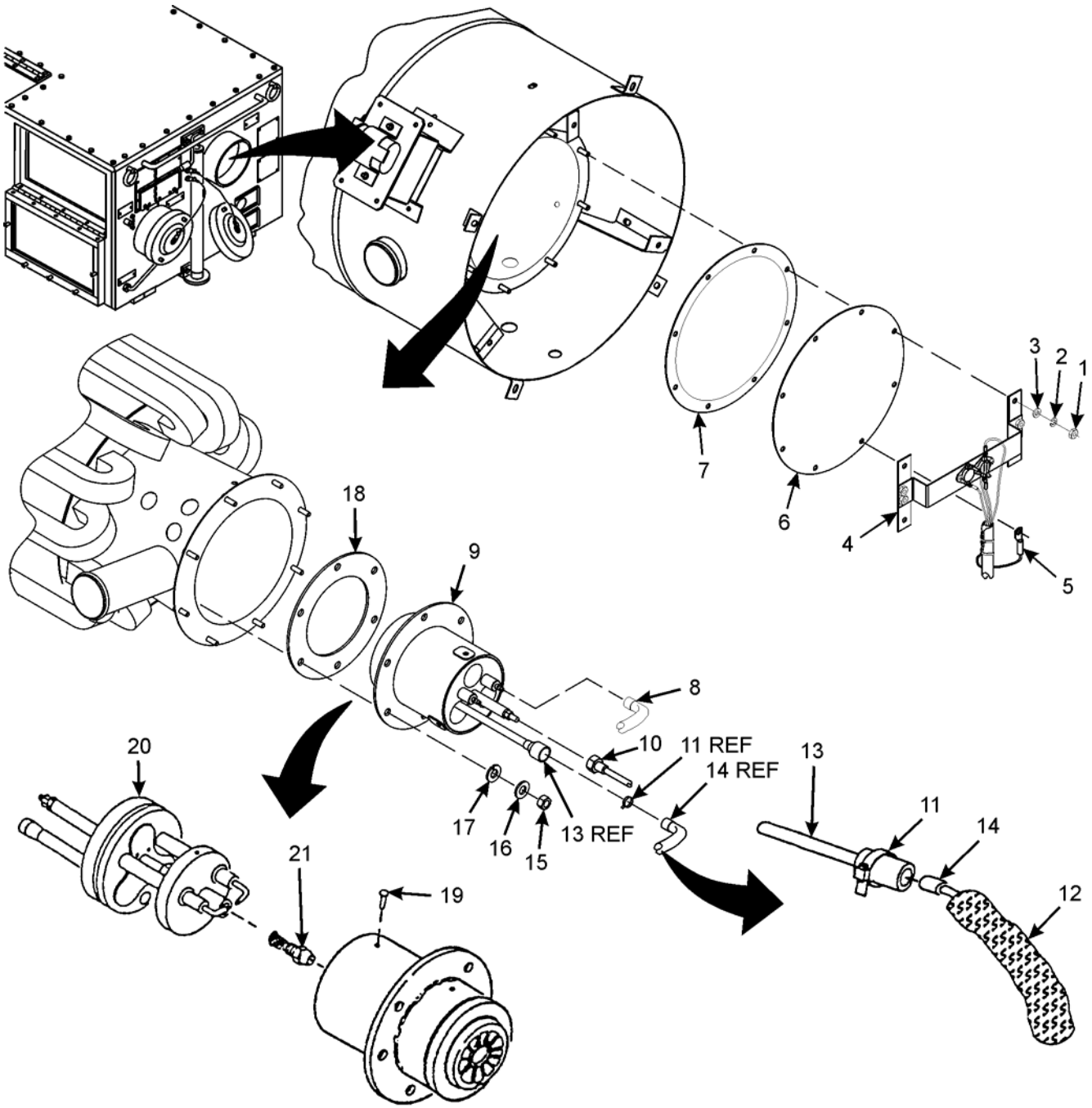
Fuel on clothing can be fatal if ignited by a static discharge. If fuel gets on clothes, leave the refueling area as soon as possible, remove clothes, and wash skin with warm, soapy water before getting dressed.

Spilled fuel creates a flammable, vapor-air mixture and fire can take place. Improper positioning of external fuel source can cause fuel tank to overflow. Stop refueling immediately if fuel spill occurs.

REMOVAL

1. Remove eight nuts (1), lockwashers (2), washers (3), and thermostat bracket assembly (4). Discard lockwashers.
2. Tag and disconnect braided wire (5) and remove cover plate (6).
3. Remove gasket (7) from cover plate (6).
4. Disconnect two high-tension leads (8) from electrodes on burner assembly (9).
5. Disconnect fuel line (10).
6. Loosen clamp (11), slide braided shield (12) off of tube (13), and remove flame detector (14).
7. Remove six nuts (15), lockwashers (16), and washers (17). Discard lockwashers.
8. Remove burner assembly (9) and gasket (18).
9. Remove three setscrews (19) and block (20).
10. Remove filter/nozzle (21).

REMOVAL – Continued



INSPECTION

1. Inspect burner assembly (10) for cracks, wear, and damage to parts.

2. Inspect for carbon/soot buildup and clean as required.

REPAIR

WARNING

Cleaning compound solvent vapors are toxic. Avoid prolonged or repeated breathing of vapors or solvent contact with skin. Use only with adequate ventilation. Solvent is flammable and should not be used near open flame. Be sure a fire extinguisher is available.

1. Clean burner assembly (9) with cleaning compound solvent and let dry.
2. Repair is limited to replacement of nozzle/filter (21), and burner assembly (9). Refer any additional damage to direct support maintenance.

INSTALLATION

1. Apply sealing compound to threads of filter/nozzle (21) and install filter/nozzle.
2. Install block (20) and three setscrews (19).

NOTE

Burner assembly must be installed with the flame detector tube on the bottom.

3. Install gasket (18) and burner assembly (9) with six washers (17), lockwashers (16), and nuts (15).
4. Slide clamp (11) onto tube (13), install flame detector (14) into tube, and slide braided shield (12) over tube. Position clamp over flame detector and braided shield. Tighten clamp.
5. Connect fuel line (10).
6. Twist two high-tension leads (8) three full turns and install leads.
7. Install gasket (7) onto cover plate (6).
8. Install cover plate (6) and braided wire (5).
9. Install thermostat bracket assembly (4) with eight washers (3), lockwashers (2), and nuts (1).

END OF WORK PACKAGE

UNIT MAINTENANCE INSTRUCTIONS

IMPROVED ARMY SPACE HEATER H-140

NSN 4520-01-477-0568

HEAT EXCHANGER ASSEMBLY
DISASSEMBLY, REPAIR, ASSEMBLY

INITIAL SETUP:

Test Equipment
None

Tools and Special Tools
Automotive general mechanic's tool kit (item 10, WP 0058 00)

Personnel Required
One

References
FM 10-67-1

Materials/Parts
Anti-seize compound (item 2, WP 0061 00)
Braided shield (item 68, WP 0047 00)

Materials/Parts – Continued
General purpose detergent (item 4, WP 0061 00)
Lockwasher (item 23, WP 0062 00)
Lockwasher (item 33, WP 0062 00)
Sealing compound (item 17, WP 0061 00)
Wiping rag (item 14, WP 0061 00)
Wire marker tag (item 25, WP 0061 00)
Wire tie (item 24, WP 0061 00)

Equipment Condition
IASH disconnected from power source (WP 0005 00)
Supply duct air screen removed (WP 0025 00)
Supply duct cover assembly removed (WP 0024 00)

WARNING

Contact with hot components can cause burns. Allow IASH to cool down before attempting service, inspection, or maintenance activity.

NOTE

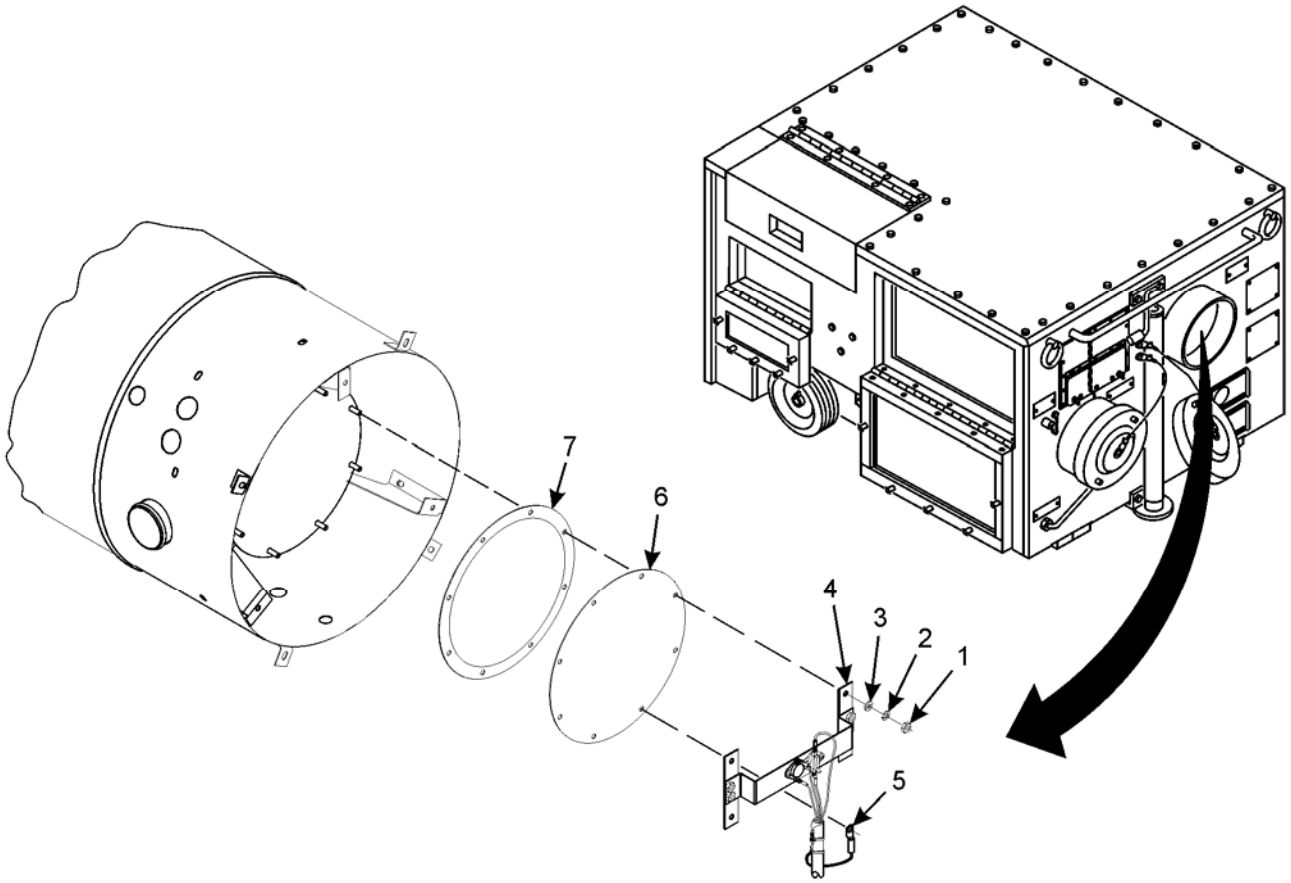
The fuel pump cited in this work package may be either the Suntec Fuel Pump (P/N J6BC-325-3) or the Webster Fuel Pump (P/N 60889-1).

DISASSEMBLY

Flame Detector Removal

1. Remove eight nuts (1), lockwashers (2), washers (3), and thermostat assembly (4). Discard lockwashers.
2. Tag and disconnect braided wire (5).
3. Remove cover plate (6) and gasket (7).

DISASSEMBLY – Continued



DISASSEMBLY – Continued

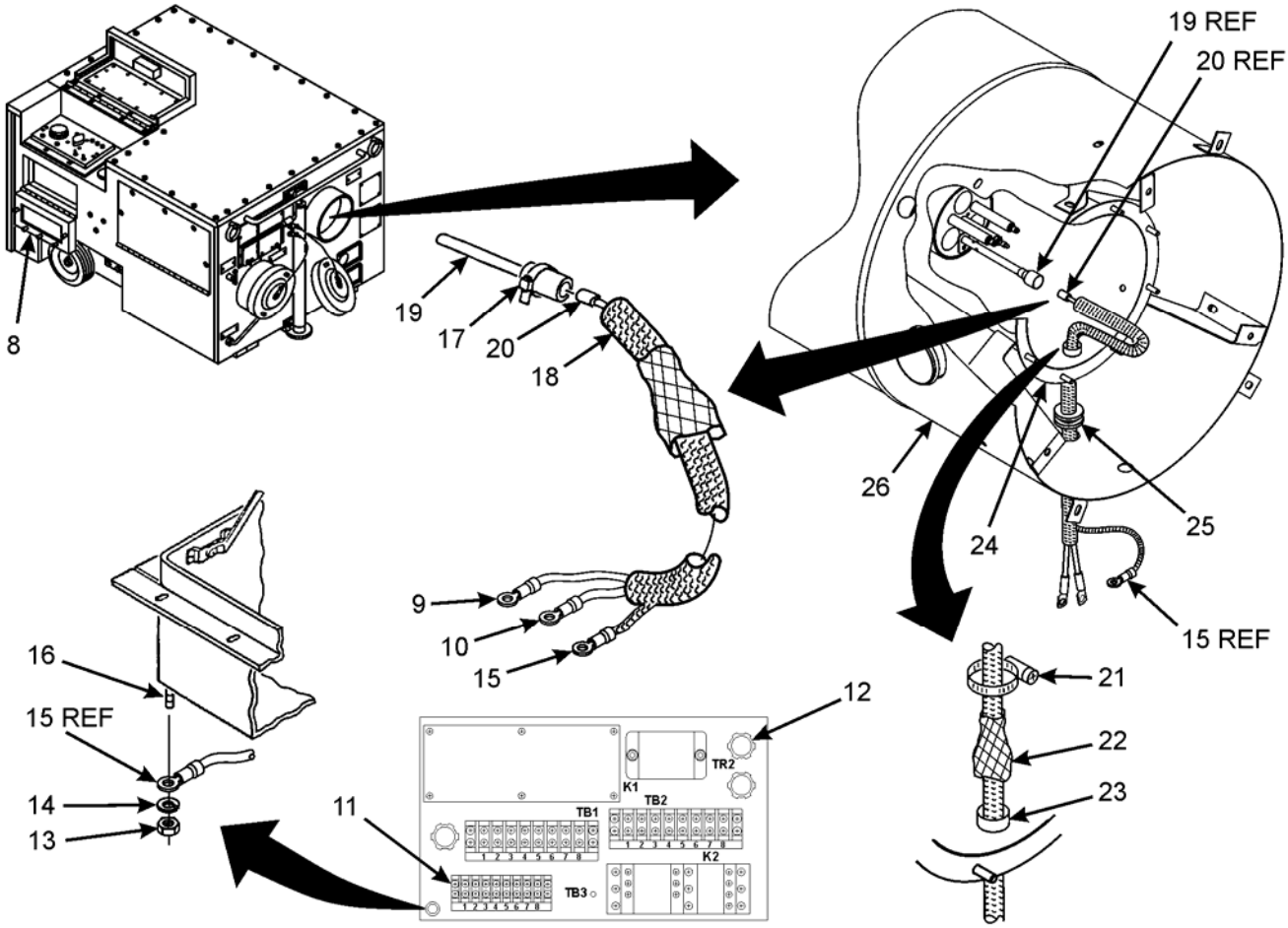
4. Open side rear door (8).
5. Tag and disconnect wire TB3-1↔D1-YEL (9) and wire TB3-2↔D1-YEL (10) from terminal board TB3 (11).
6. Cut wire ties as required.
7. Carefully guide wires (9 and 10) down through conduit (12).
8. Remove nut (13), lockwasher (14), and braided wire (15) from ground stud (16).
9. Loosen clamp (17), slide braided shield (18) off of tube (19), and remove flame detector (20) from tube.
10. Remove clamp (21) and braided shield (22) from sleeve (23).
11. Remove flame detector (20) down from heat exchanger (24).
12. Push grommet (25) out of heat exchanger shell (26) toward heat exchanger (24).

NOTE

Grommet on the flame detector does not come off of the flame detector.

13. Remove flame detector (20) through space between heat exchanger (24) and heat exchanger shell (26).

DISASSEMBLY – Continued



DISASSEMBLY – Continued

Fuel Line and Sight Glass Removal

WARNING

FOR FUEL SPILLS, REFER TO FM 10-67-1, CONCEPTS AND EQUIPMENT OF PETROLEUM OPERATIONS.

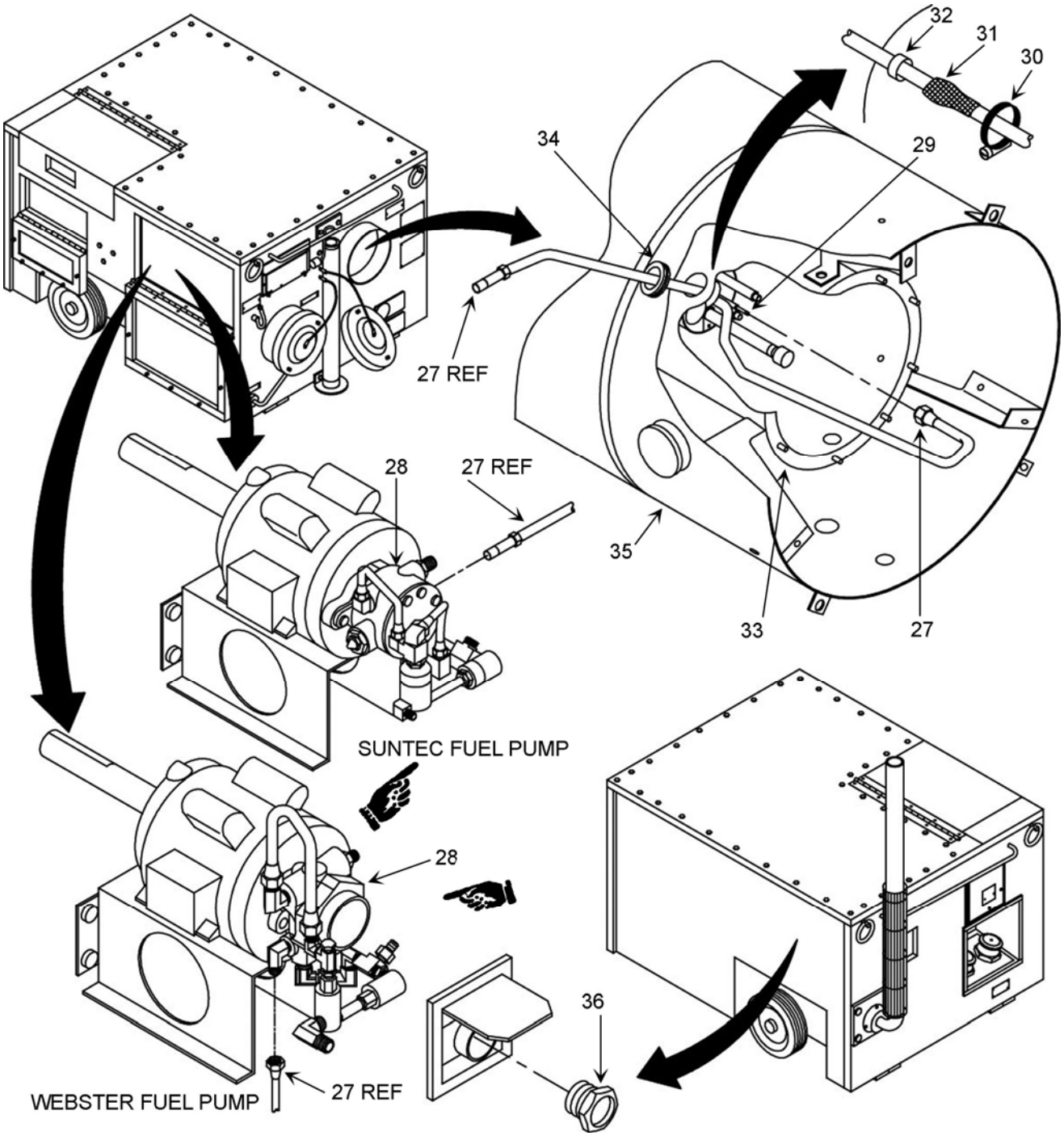
Fuel is flammable and toxic to eyes, skin, and respiratory tract. Skin/eye protection is required. Avoid repeated/prolonged contact. Use only in well-ventilated areas. Keep away from open flames or other sources of ignition. Post FUEL FLAMMABLE/NO SMOKING signs around the area. Be sure a fire extinguisher is available.

Fuel on clothing can be fatal if ignited by a static discharge. If fuel gets on clothes, leave the refueling area as soon as possible, remove clothes, and wash skin with warm, soapy water before getting dressed.

Spilled fuel creates a flammable, vapor-air mixture and fire can take place. Improper positioning of external fuel source can cause fuel tank to overflow. Stop refueling immediately if fuel spill occurs.

1. Disconnect fuel line (27) from fuel pump (28) and burner (29).
2. Remove clamp (30) and braided shield (31) from sleeve (32).
3. Remove fuel line (27) up from heat exchanger (33).
4. Push grommet (34) inward from heat exchanger shell (35) toward heat exchanger (33).
5. Remove fuel line (27) through space between heat exchanger (33) and heat exchanger shell (35).
6. Remove sight glass (36).

DISASSEMBLY – Continued



REPAIR

Repair is limited to replacement of defective parts.

ASSEMBLY

Fuel Line and Sight Glass Installation

WARNING

FOR FUEL SPILLS, REFER TO FM 10-67-1, CONCEPTS AND EQUIPMENT OF PETROLEUM OPERATIONS.

Fuel is flammable and toxic to eyes, skin, and respiratory tract. Skin/eye protection is required. Avoid repeated/prolonged contact. Use only in well-ventilated areas. Keep away from open flames or other sources of ignition. Post FUEL FLAMMABLE/NO SMOKING signs around the area. Be sure a fire extinguisher is available.

Fuel on clothing can be fatal if ignited by a static discharge. If fuel gets on clothes, leave the refueling area as soon as possible, remove clothes, and wash skin with warm, soapy water before getting dressed.

Spilled fuel creates a flammable, vapor-air mixture and fire can take place. Improper positioning of external fuel source can cause fuel tank to overflow. Stop refueling immediately if fuel spill occurs.

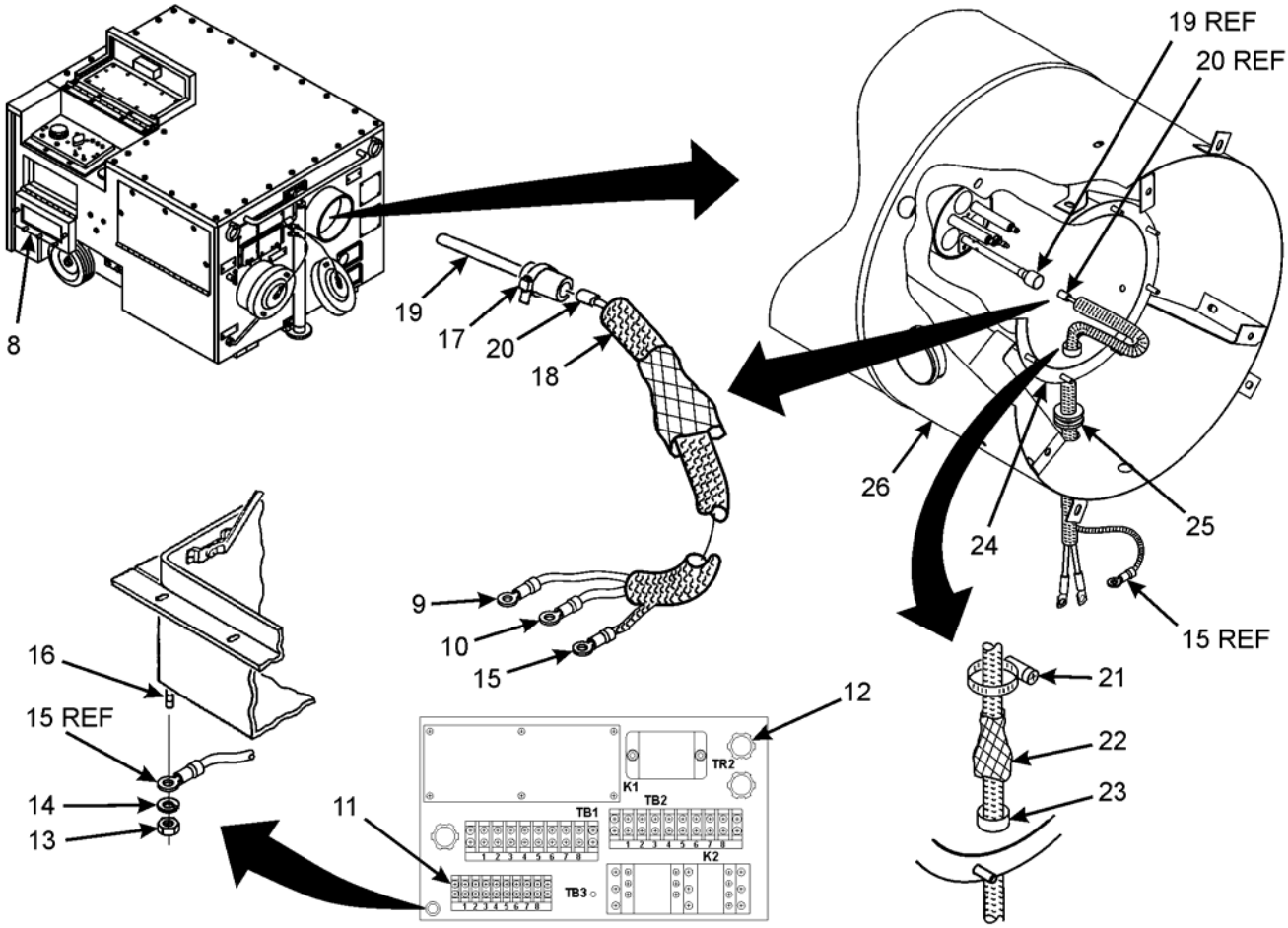
1. Clean both sides of sight glass (36) with general purpose detergent and water.
2. Apply anti-seize compound to sight glass (36) and install sight glass.
3. Install fuel line (27) through space between heat exchanger shell (35) and heat exchanger (33) with braided shield end toward heat exchanger.
4. Install grommet (34) onto heat exchanger shell (35).
5. Apply sealing compound to threads of fuel line (27).
6. Adjust length of fuel line (27) within heat exchanger (33), gently bending as required, and connect fuel line to burner (29).
7. Install braided shield (31) onto sleeve (32) and install clamp (30).
8. Connect fuel line (27) to fuel pump (28).

ASSEMBLY – Continued

Flame Detector Installation

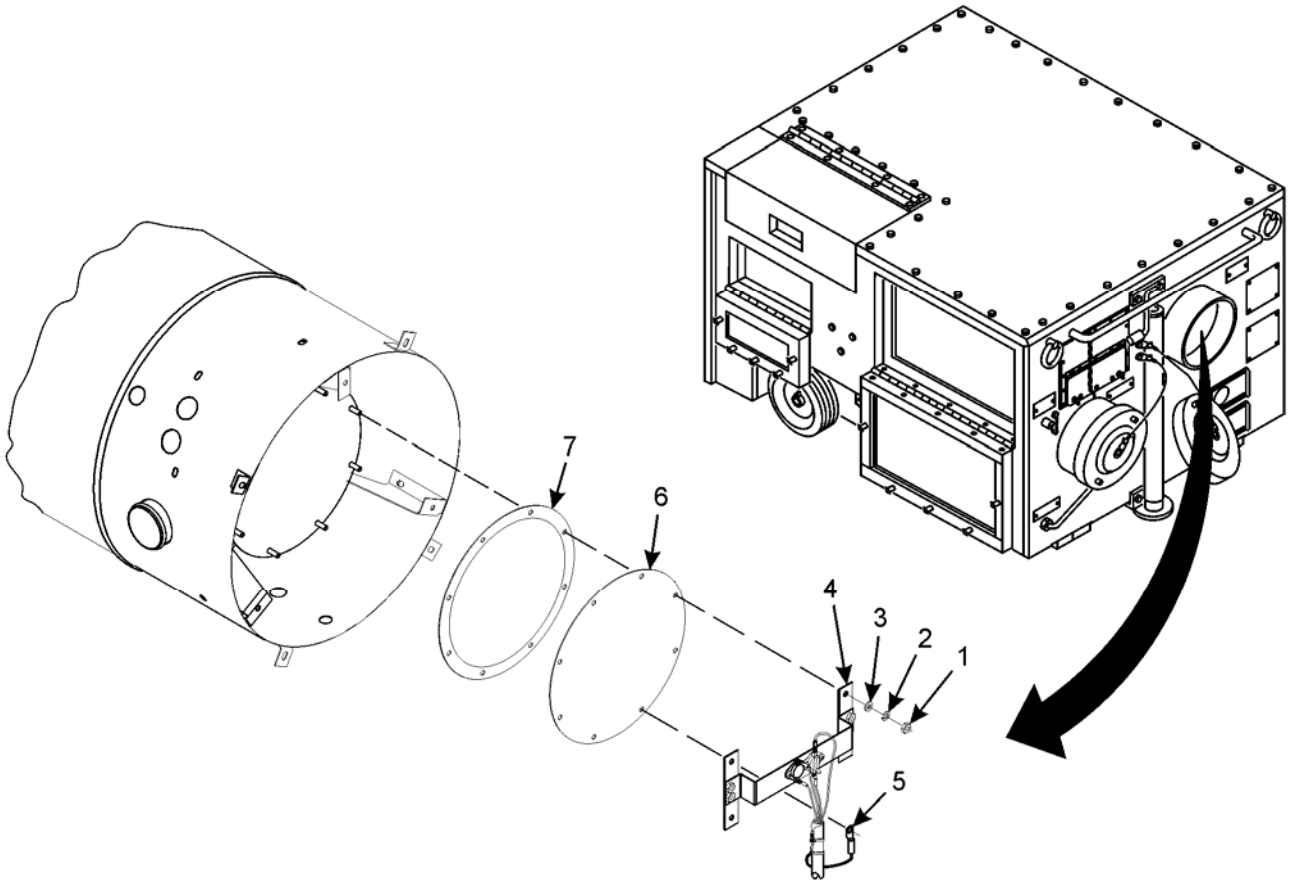
1. Insert wire end of flame detector (20) up through bottom hole of heat exchanger shell (26) and through bottom hole of heat exchanger (24).
2. Install grommet (25) into heat exchanger shell (26).
3. Install braided shield (22) and clamp (21) onto sleeve (23).
4. Slide clamp (17) onto tube (19), install flame detector (20) into tube, and slide braided shield (18) over tube. Tighten clamp.
5. Route wires (10 and 9) from flame detector (20) along wire bundle and guide wires up through conduit (12).
6. Install braided wire (15), lockwasher (14) (item 23, WP 0062 00), and nut (13) onto ground stud (16).
7. Connect wire TB3-2↔D1-YEL (10) and wire TB3-1↔D1-YEL (9) to TB3 (11). Remove wire marker tags.
8. Install wire ties as required.
9. Close side rear door (8).

ASSEMBLY – Continued



ASSEMBLY – Continued

10. Install gasket (7) onto cover (6) and install cover.
11. Connect braided wire (5). Remove wire marker tags.
12. Install thermostat bracket assembly (4).
13. Install eight washers (3), lockwashers (2) (item 33, WP 0062 00), and nuts (1).



END OF WORK PACKAGE

UNIT MAINTENANCE INSTRUCTIONS

ARMY SPACE HEATER H-140

NSN 4520-01-477-0568

REMOTE CONTROL BOX DISASSEMBLY, INSPECTION, REPAIR, ASSEMBLY

INITIAL SETUP:

Test Equipment
None

Tools and Special Tools
Automotive general mechanics tool kit (item 10, WP 0058 00)
Blind riveter (item 2, WP 0058 00)
Crimping tool (item 6, WP 0058 00)
Drill (item 6, WP 0058 00)
Drill bit (item 6, WP 0058 00)
Rivnut tool (item 3, WP 0058 00)
Soldering iron (item 8, WP 0058 00)

Personnel Required
One

References
None

Materials/Parts
Chain (item 83, WP 0047 00)
Lockwasher (item 26, WP 0062 00)
Lockwasher (item 27, WP 0062 00)
O-ring (item 43, WP 0062 00
Rivet (item 5, WP 0062 00)
Rivnut (item 12, WP 0062 00)
Sealing compound (item 16, WP 0061 00)
Solder (item 23, WP 0061 00)
Wire marker tag (item 25, WP 0061 00)
Wire tie (item 24, WP 0061 00)

Equipment Conditions
ASH disconnected from power source (WP 0005 00)

DISASSEMBLY

Front Panel Assembly Removal

CAUTION

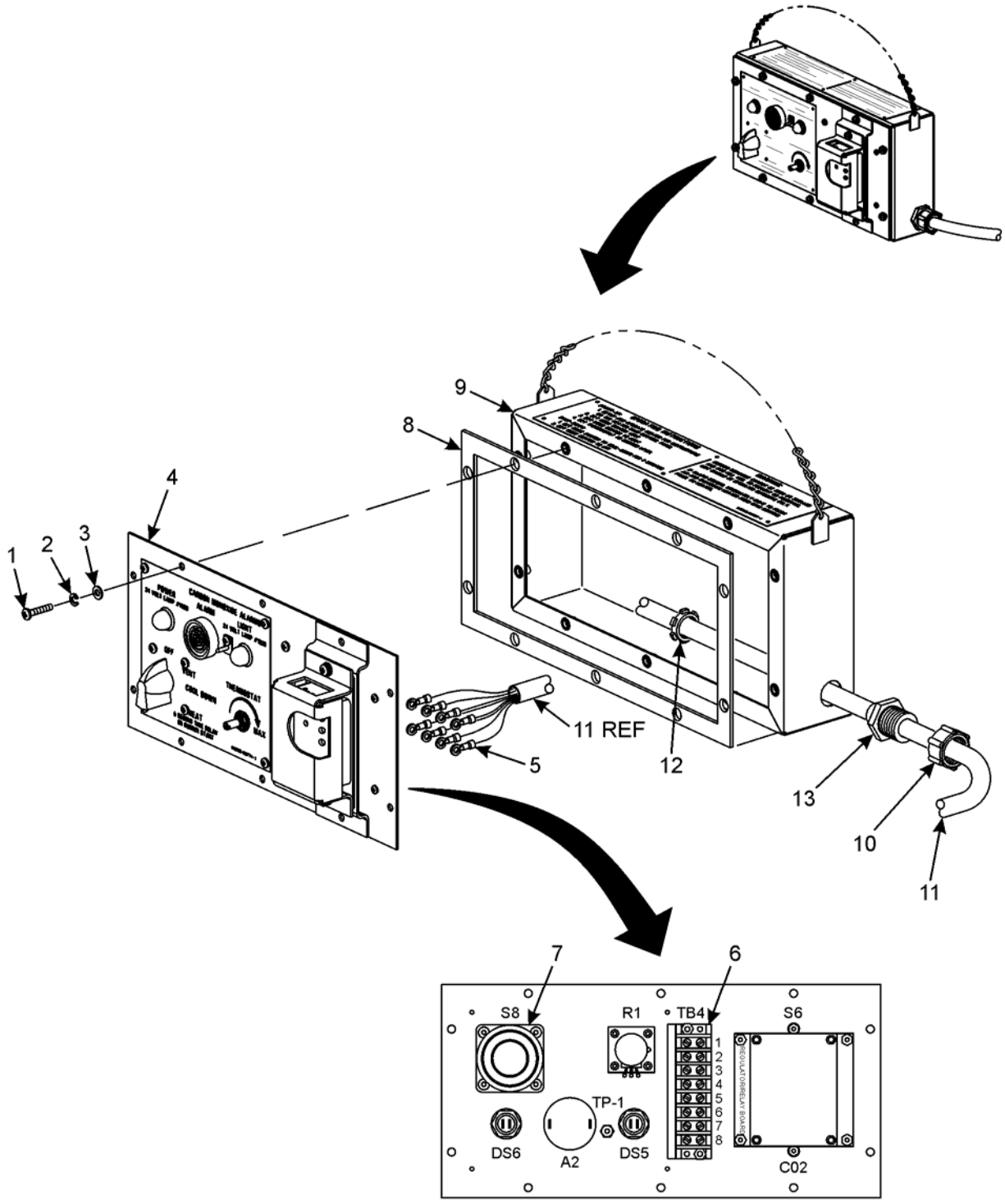
When the front panel mounting screws are removed, the carbon monoxide detector will be loose. Handle the front panel carefully to avoid damage to the carbon monoxide detector wiring.

1. Remove ten screws (1), lockwashers (2), and washers (3). Discard lockwashers.
2. Carefully position front panel assembly (4) for access to internal wiring.
3. Tag and disconnect four wires (5) from terminal board TB4 (6) terminals 1, 2, 3, and 5. Connect remaining wires.
4. Tag and disconnect wire (5) from terminal board TB4 (6) mounting screw.
5. Tag and disconnect three wires (5) from mode switch S8 (7) terminals 11, 31, and 34. Connect remaining wires.
6. Cut wire ties as required.
7. Remove gasket (8) from enclosure (9).

DISASSEMBLY – Continued

8. Loosen locknut (10) and remove cable (11) from enclosure (9).

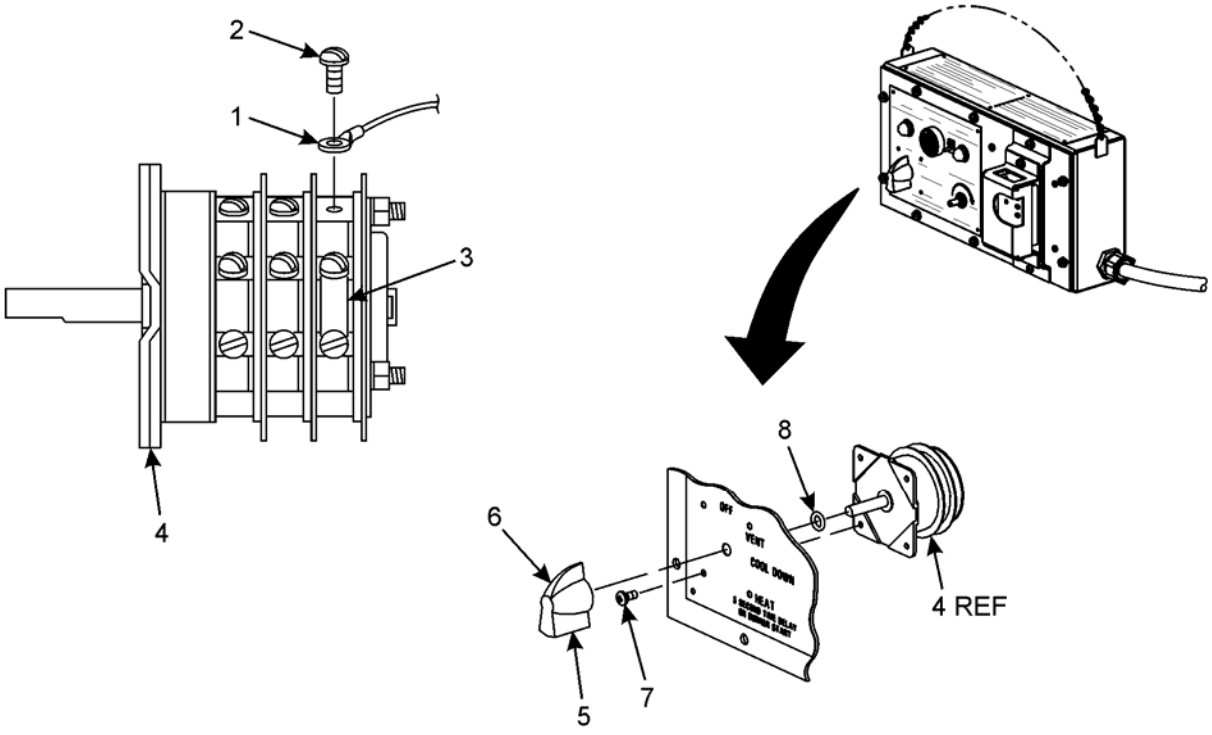
9. Remove nut (12) and connector (13).



DISASSEMBLY – Continued

Mode Switch S8 Removal

1. Remove front panel assembly (WP 0038 00-1).
2. Tag and disconnect four wires (1) by removing screws (2).
3. Remove four jumpers (3) from mode switch S8 (4), if necessary, by removing screws (2).
4. Loosen setscrew (5) and remove knob (6).
5. Remove four screws (7), mode switch S8 (4), and O-ring (8).



DISASSEMBLY – Continued

Thermostat Control R1 Removal

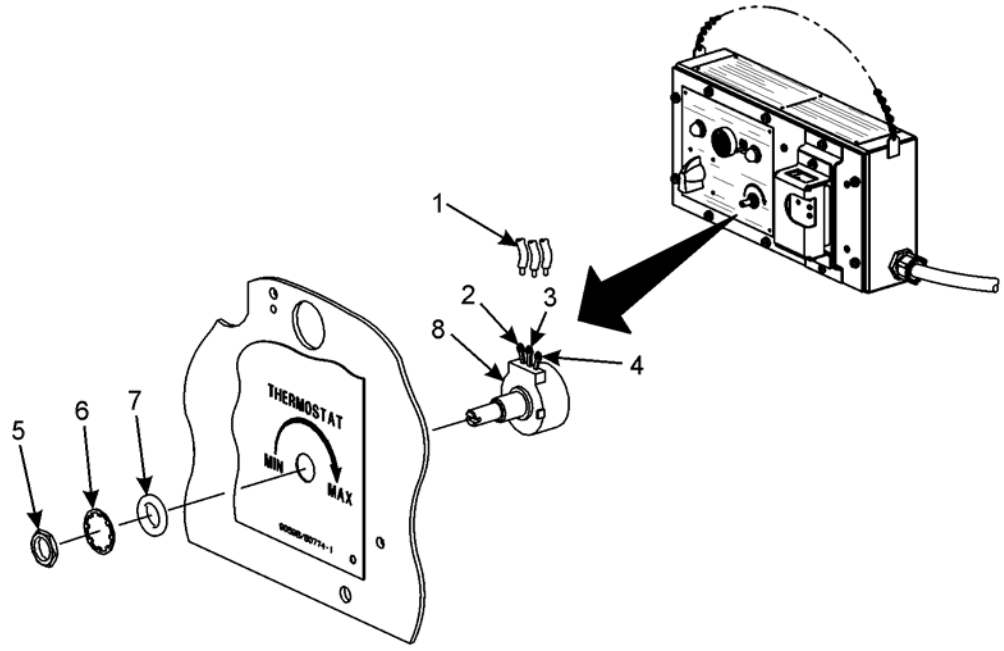
1. Remove front panel assembly (WP 0038 00-1).

WARNING

Avoid breathing fumes generated by soldering. Eye protection is required. Good general ventilation is normally adequate.

2. Tag and unsolder three wires (1) from thermostat control R1 terminals (2, 3, and 4).

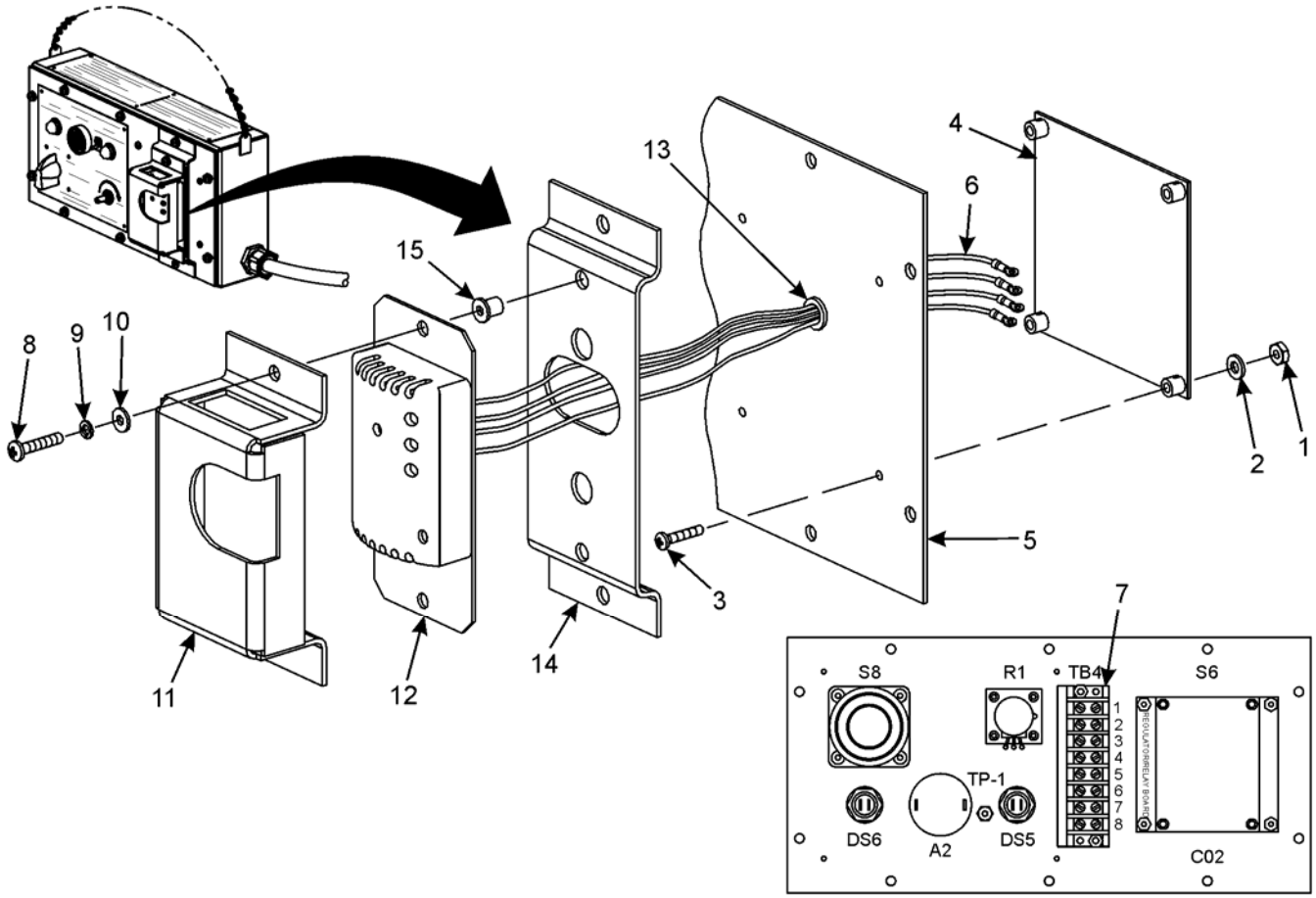
3. Remove nut (5), lockwasher (6), O-ring (7), and thermostat control R1 (8).



DISASSEMBLY – Continued

Carbon Monoxide Detector CO2 Removal

1. Remove front panel assembly (WP 0038 00-1).
2. Remove four nuts (1), washers (2), and screws (3). Gently move remote controller S6 (4) away from front panel assembly (5) for access to wires (6).
3. Tag and disconnect four wires (6) from terminal board TB4 (7) terminals 6, 7, and 8.
4. Remove two screws (8), lockwashers (9), washers (10), and cover (11).
5. Carefully remove carbon monoxide detector CO2 (12) while guiding individual wires (6) through grommet (13). Remove grommet only if damaged.
6. Remove bracket (14) from wires (6).
7. Drill out rivnuts (15) if damaged.



DISASSEMBLY – Continued

Remote Controller S6 and Temperature Sensor TP-1 Removal

1. Remove front panel assembly (WP 0038 00-1).

WARNING

Avoid breathing fumes generated by soldering. Eye protection is required. Good general ventilation is normally adequate.

2. Cut wire ties as required.

3. Tag and unsolder three wires (1) from thermostat control R1 terminals (2, 3, and 4).

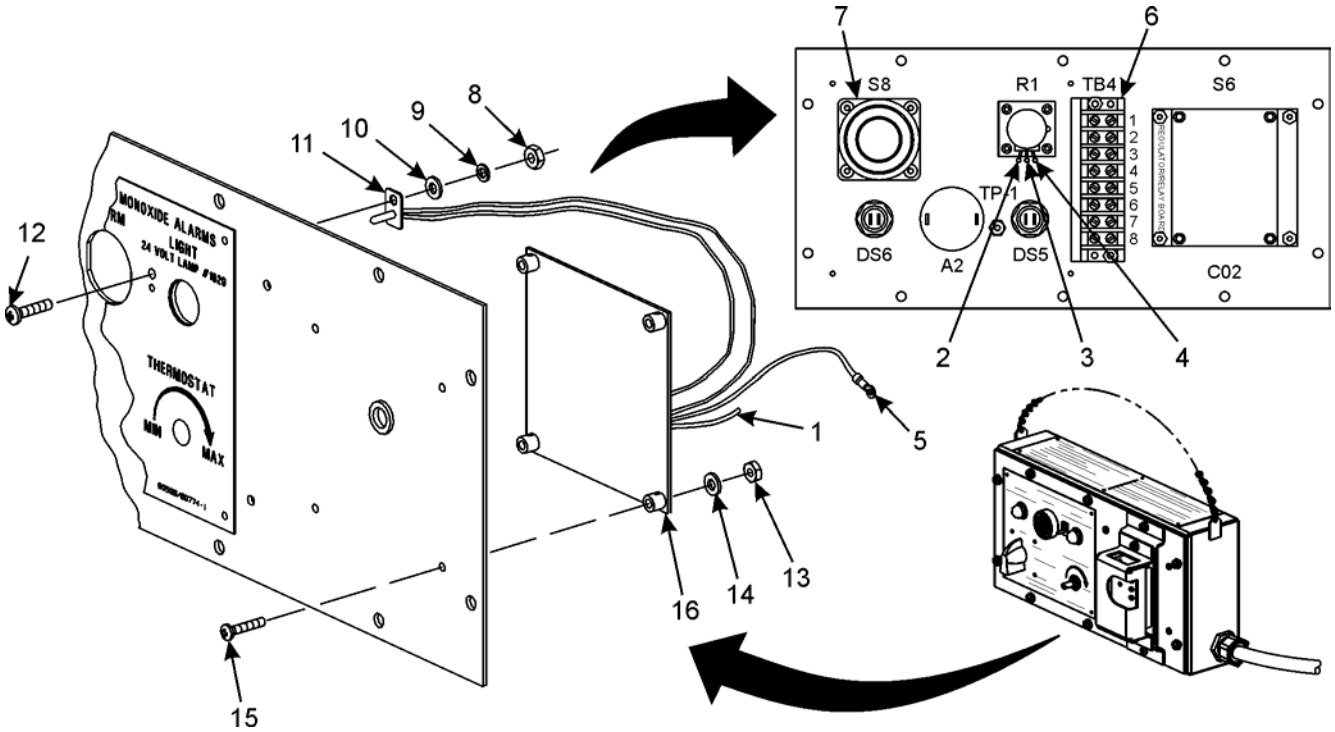
4. Tag and disconnect following seven wires (5) from terminal board TB4 (6). Connect remaining wires.

   Yellow wire S6-P10 from TB4-8
   Black wire S6-P11 from TB4-7
   Red wire S6-P9 from TB4-6
   Orange wire S6-P14 from TB4-5
   Blue wire S6-P2 from TB4-4
   White wire S6-P13 from TB4-2
   Red wire S6-P1 from TB4-1

5. Tag and disconnect white wire (5) from mode switch S8 (7) terminal 14.

6. Remove two nuts (8), lockwashers (9), washers (10), temperature sensor TP-1 (11), and screw (12).

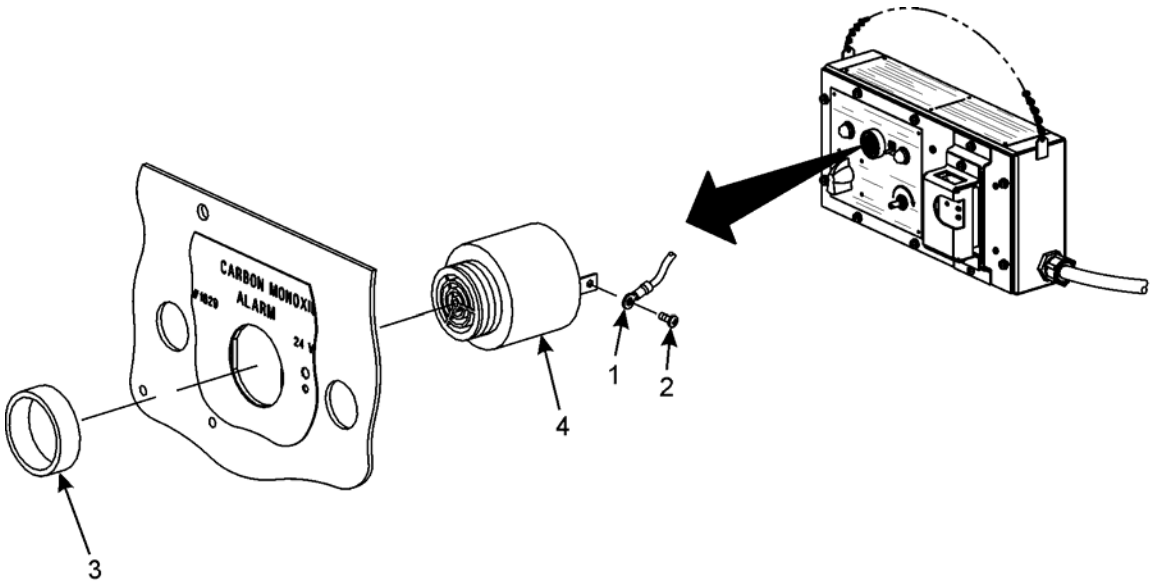
7. Remove four nuts (13), washers (14), screws (15), and remote controller S6 (16).



DISASSEMBLY – Continued

CARBON MONOXIDE ALARM Removal

1. Remove front panel assembly (WP 0038 00-1).
2. Tag and disconnect two wires (1) by removing screws (2).
3. Remove mounting ring (3) and CARBON MONOXIDE ALARM (4).



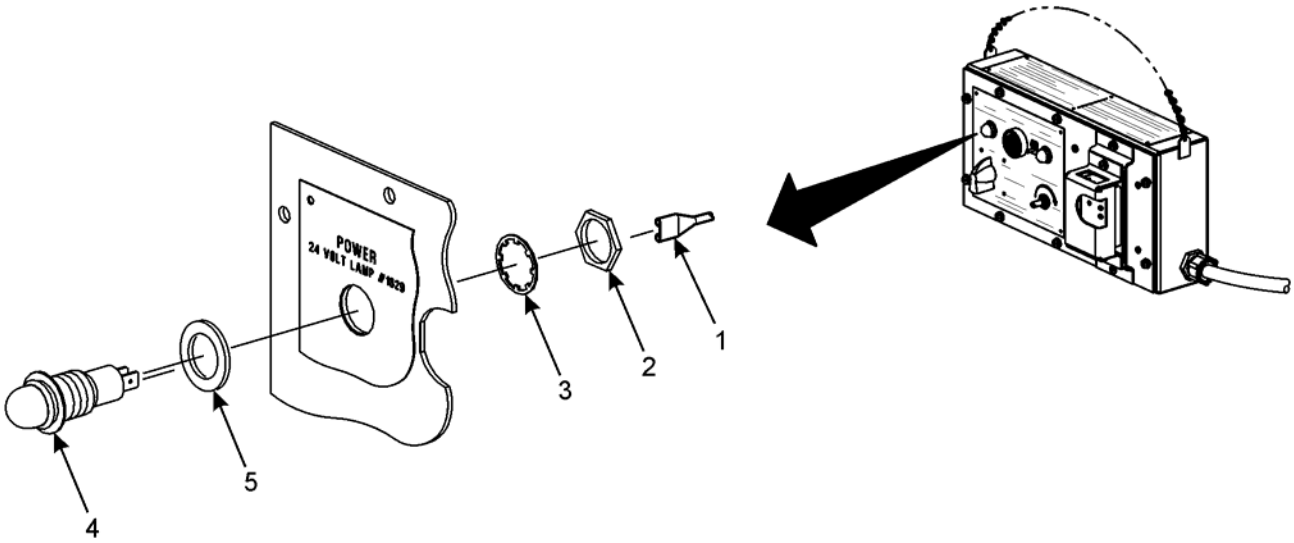
DISASSEMBLY – Continued

POWER Indicator Light DS6 and CARBON MONOXIDE ALARMS LIGHT DS5 Removal

NOTE

Procedures are typical for POWER indicator light DS6 and CARBON MONOXIDE ALARMS LIGHT DS5. POWER indicator light DS6 is shown.

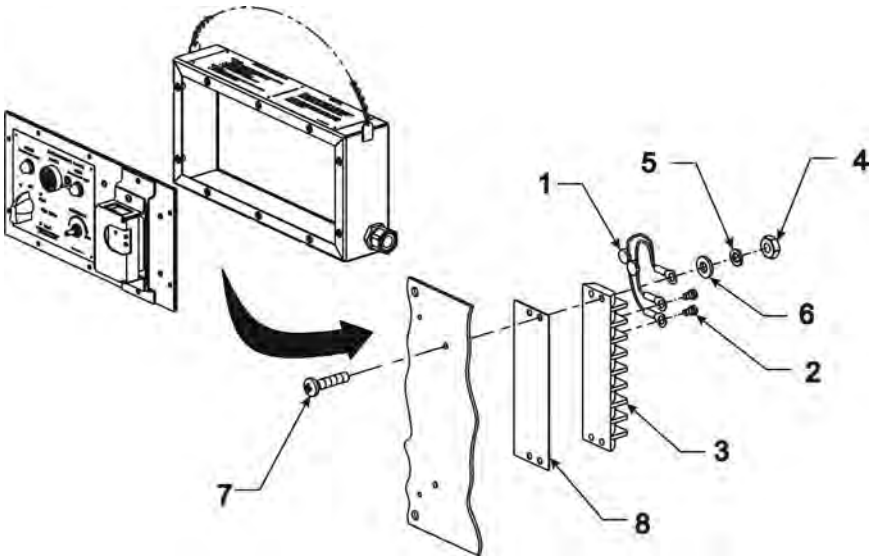
1. Remove front panel assembly (WP 0038 00-1).
2. Tag and disconnect two wires (1).
3. Remove nut (2), lockwasher (3), POWER indicator light DS6 (4), and seal (5).



DISASSEMBLY – Continued

EMI Jumper and Terminal Board TB4 Removal

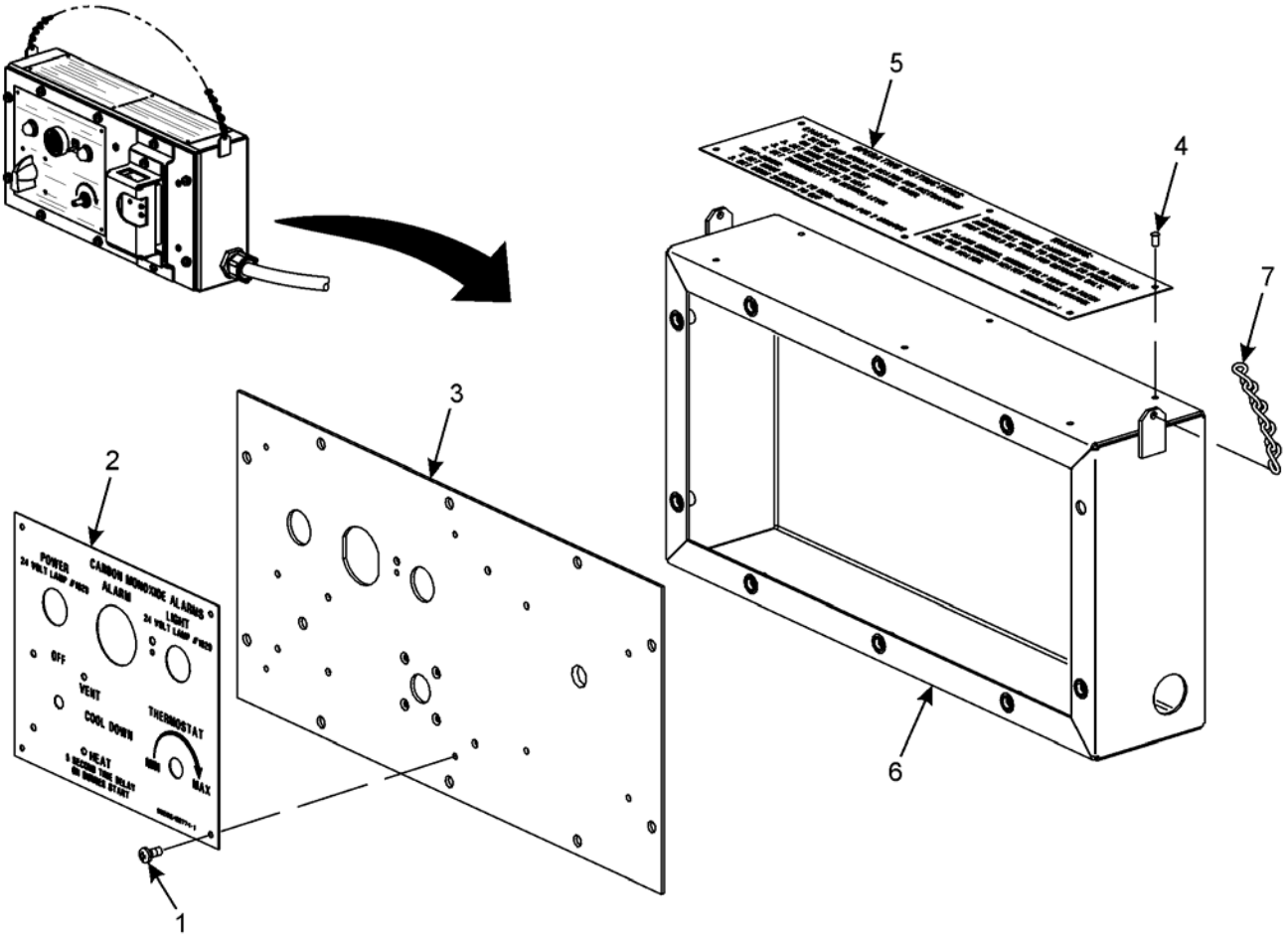
1. Remove front panel assembly (WP 0038 00-1).
2. Tag and disconnect all wires and two EMI jumper (1) leads by removing eight screws (2) from terminal board TB4 (3).
3. Cut wire ties as required.
4. Remove two nuts (4), lockwashers (5), washers (6), screws (7), EMI jumper (1), terminal board TB4 (3), and marker strip (8).



DISASSEMBLY – Continued

Data Plate and Chain Removal

1. Remove front panel assembly (WP 0038 00-1).
2. Remove mode switch S8 (WP 0038 00-3).
3. Remove thermostat control R1 (WP 0038 00-4).
4. Remove carbon monoxide detector CO2 (WP 0038 00-5).
5. Remove remote controller S6 and temperature sensor TP-1 (WP 0038 00-6).
6. Remove CARBON MONOXIDE ALARM (WP 0038 00-7).
7. Remove POWER indicator light DS6 and CARBON MONOXIDE ALARMS LIGHT DS5 (WP 0038 00-8).
8. Remove EMI jumper and terminal board TB4 (WP 0038 00-9).
9. Drill out four rivets (1) and remove data plate (2) from front panel (3).
10. Drill out six rivets (4) and remove data plate (5) from enclosure (6).
11. Open link and remove chain (7) from enclosure (6).



INSPECTION

1. Inspect connections for secure mounting; burnt, broken or bent terminals; and corrosion.
2. Inspect cable for cracked, burned, or deteriorated insulation and exposed conductor.
3. Inspect terminal lugs for secure mounting and signs of burning and corrosion.

REPAIR

1. Repair of remote control box is limited to replacement of defective parts.
2. Repair of cable assembly consists of replacing defective parts.
3. If cable is damaged, replace complete cable assembly as follows:
   a. Remove cover (1) from connector plug (2).
   b. Remove two screws (3), cover assembly chain (4), and two saddles (5).
   c. Unscrew clamp (6) and slide clamp and sleeve (7) down on cable (8).
   d. Tag eight wires (9) and cut connector plug (2) from cable (8).
   e. Slide sleeve (7) and clamp (6) from cable (8).
   f. Cut away insulation sleeving (10) from cable (8) and slide new insulation sleeving onto cable.
   g. Slide clamp (6) and sleeve (7) onto cable (8).
   h. Strip 0.75 inch (1.9 cm) of insulation from cable (8) to expose wires (9).
   i. Strip 0.25 inch (0.6 cm) of insulation from wires (9).
   j. Crimp connector plug (2) pins to wires (9).

NOTE

Outer sleeve of the cable may be split up to 2.5 inches (6.4 cm) to facilitate insertion of the connector pins into the connector plug.

   k. Insert following eight connector plug (2) pins. Remove wire marker tags.

Black wire to pin A
White wire to pin B
Green wire to pin C
Red wire to pin D
Blue wire to pin E
Orange wire to pin F
Red/black wire to pin G
White/black wire to pin H

   l. Position insulation sleeving (10) over cable split and shrink sleeving.

REPAIR – Continued

NOTE

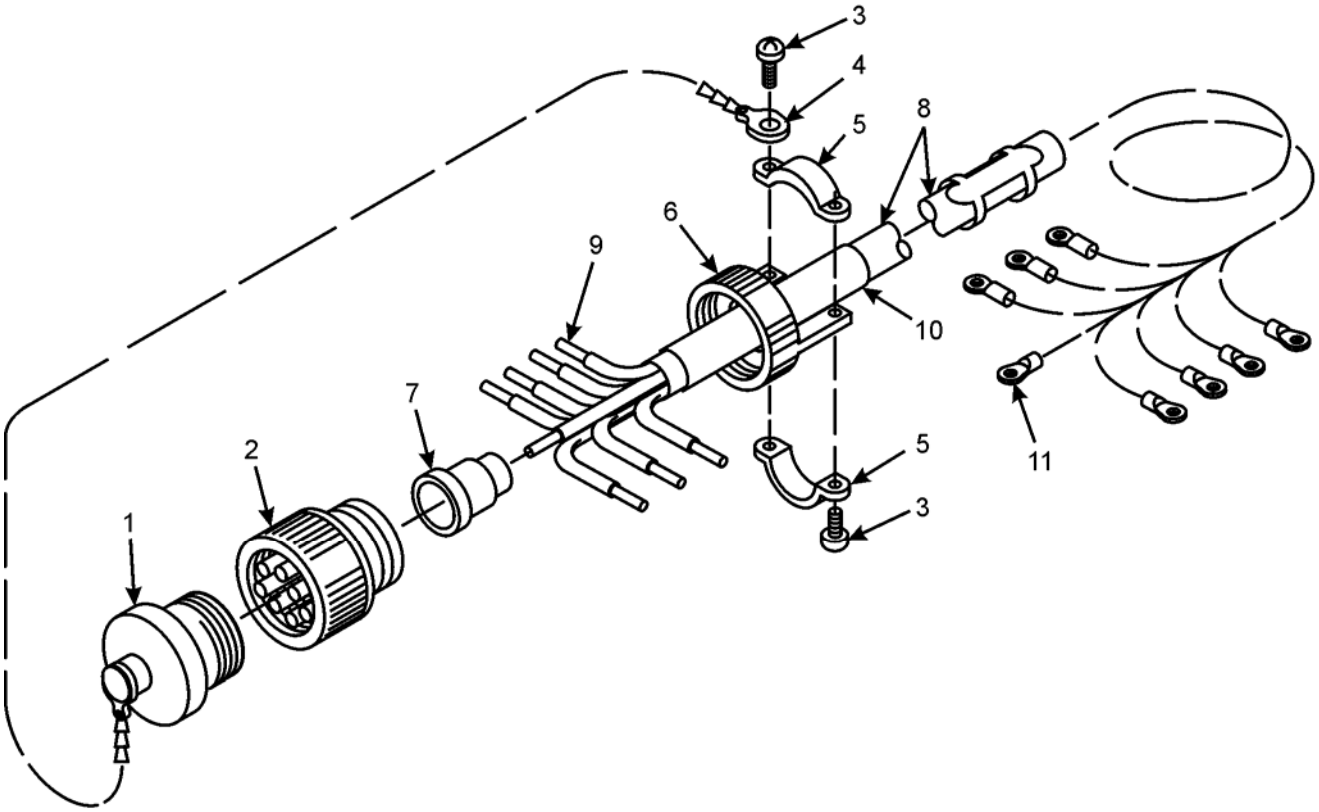
Hold the connector plug securely while turning the clamp to prevent twisting of wires.

m. Hold connector plug (2) securely and slide sleeve (7) and clamp (6) onto cable (8) and screw clamp (6) onto connector plug (2).

n. Position two saddles (5) on clamp (6) and cover assembly chain (4) on saddle and install with two screws (3).

o. Screw cover (1) into connector plug (2).

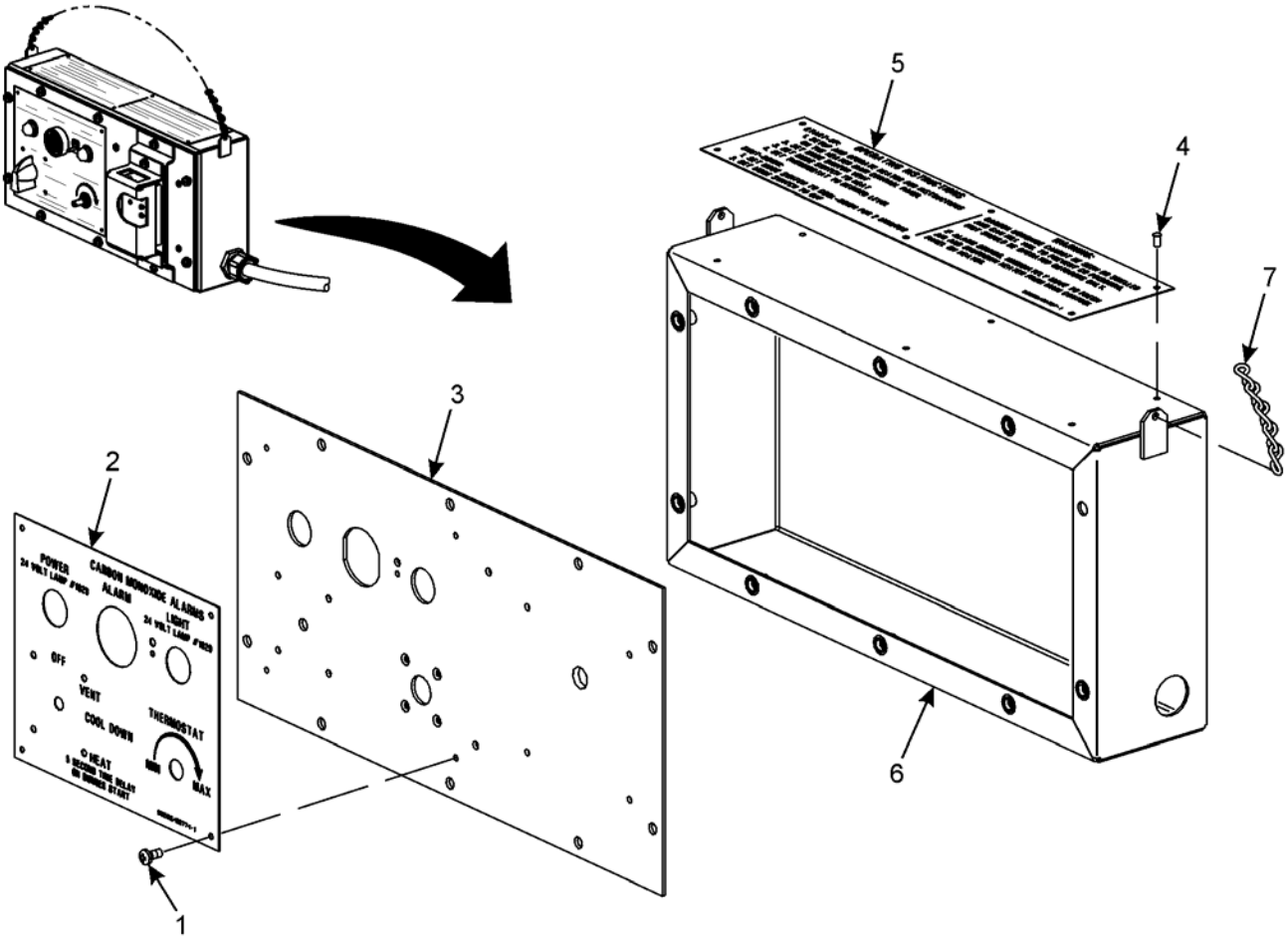
p. Repair of opposite end of cable is limited to replacement of terminal lugs (11).



ASSEMBLY

Data Plate and Chain Installation

1. Open link to install chain (7) onto enclosure (6). Then close link.
2. Position data plate (5) onto enclosure (6) and install six rivets (4).
3. Position data plate (2) onto front panel (3) and install four rivets (1).
4. Install terminal board TB4 (WP 0038 00-14).
5. Install POWER indicator light DS6 and CARBON MONOXIDE ALARMS LIGHT DS5 (WP 0038 00-15).
6. Install CARBON MONOXIDE ALARM (WP 0038 00-16).
7. Install remote controller S6 and temperature sensor TP-1 (WP 0038 00-17).
8. Install carbon monoxide detector CO2 (WP 0038 00-18).
9 Install thermostat control R1 (WP 0038 00-19).
10. Install mode switch S8 (WP 0038 00-20).
11. Install front panel assembly (WP 0038 00-21).



ASSEMBLY – Continued

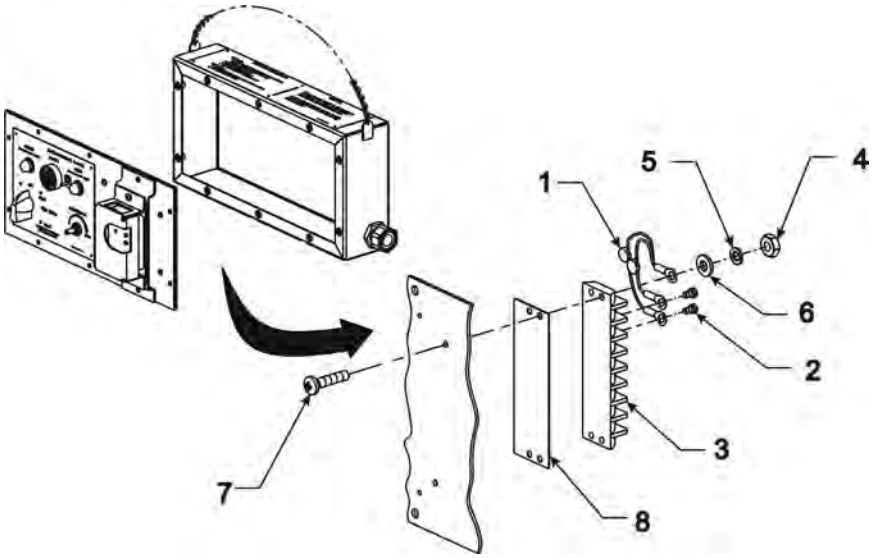
EMI Jumper and Terminal Board TB4 Installation

1. Install marker strip (8), terminal board TB4 (3), and EMI jumper (1) with two screws (7), washers (6), lockwashers (5) (item 26, WP 0062 00), and nuts (4).

2. Connect all wires and two EMI jumper (1) leads to terminal board TB4 (3) with eight screws (2). Remove wire marker tags.

3. Install wire ties as required.

4. Install front panel assembly (WP 0038 00-21).



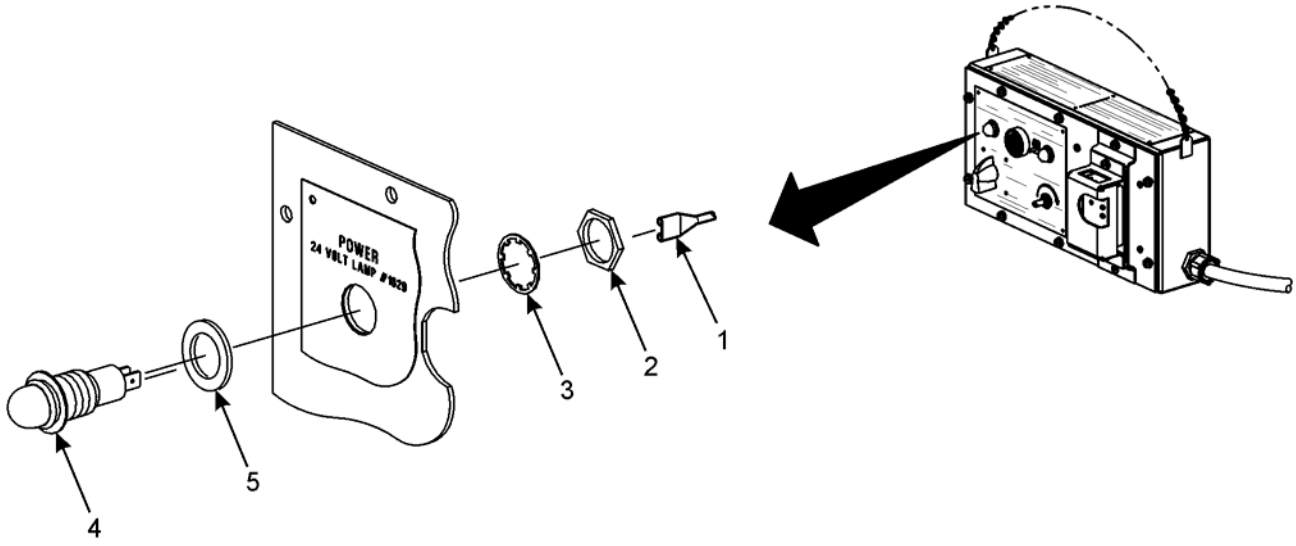
ASSEMBLY – Continued

POWER Indicator Light DS6 and CARBON MONOXIDE ALARMS LIGHT DS5 Installation

NOTE

Procedures are typical for POWER indicator light DS6 and CARBON MONOXIDE ALARMS LIGHT DS5. POWER indicator light DS6 is shown.

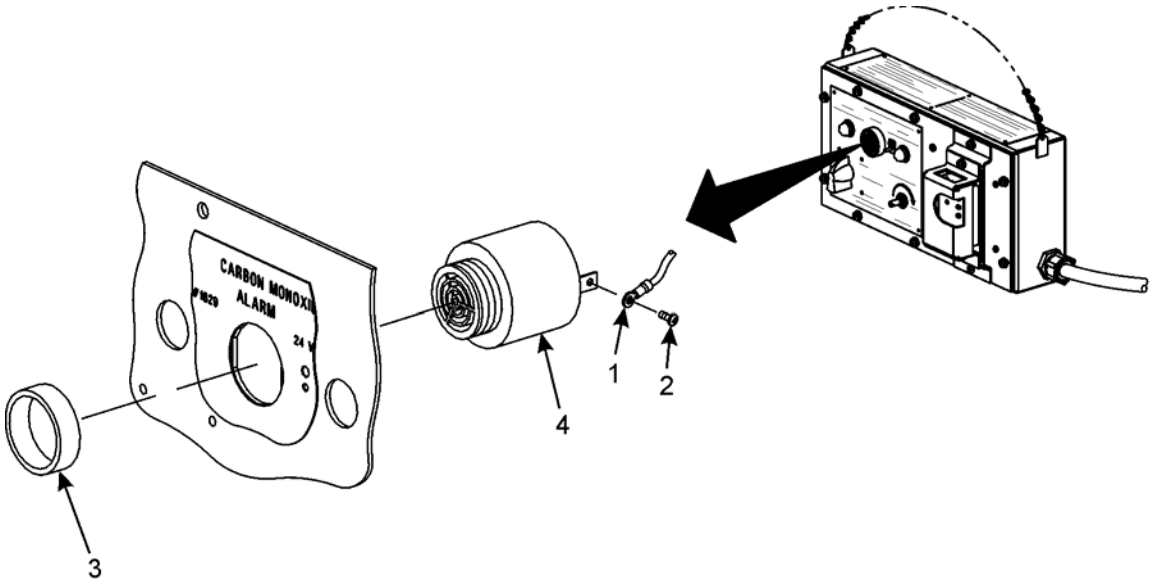
1. Install seal (5) and POWER indicator light DS6 (4) with lockwasher (3) and nut (2).
2. Connect two wires (1) to POWER indicator light DS6. Remove wire marker tags.
3. Install front panel assembly (WP 0038 00-21).



ASSEMBLY – Continued

CARBON MONOXIDE ALARM Installation

1. Install CARBON MONOXIDE ALARM (4) with mounting ring (3).
2. Connect two wires (1) with screws (2). Remove wire marker tags.
3. Install front panel assembly (WP 0038 00-21).



ASSEMBLY – Continued

Remote Controller S6 and Temperature Sensor TP-1 Installation

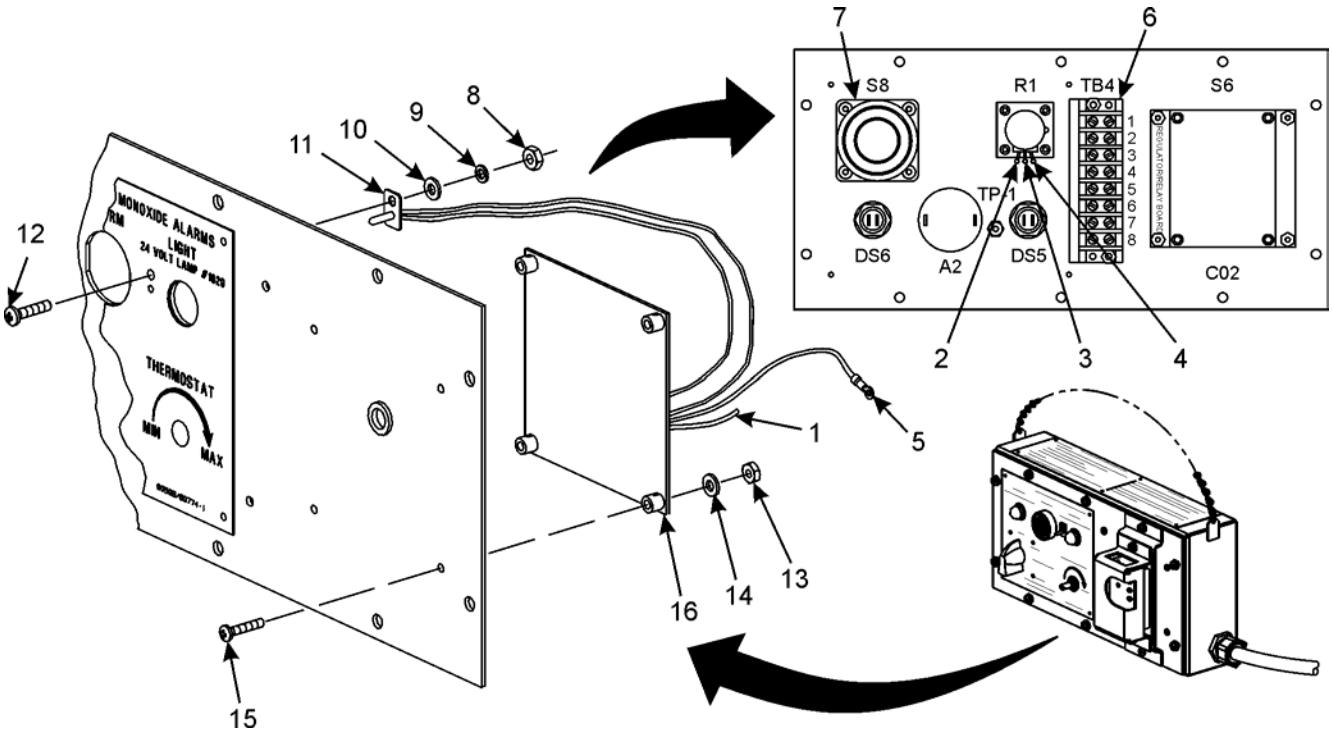
1. Position remote controller S6 (16) and secure with four screws (15), washers (14), and nuts (13).
2. Install screw (12), temperature sensor TP-1 (11), two washers (10), lockwashers (9) (item 26, WP 0062 00), and nuts (8).
3. Connect white wire S6-P12 (5) to mode switch S8 (7) terminal 14. Remove wire marker tag.
4. Connect following seven wires (5) to terminal board TB4 (6). Remove wire marker tags.

   Red wire S6-P1 to TB4-1
   White wire S6-P13 to TB4-2
   Blue wire S6-P2 to TB4-4
   Orange wire S6-P14 to TB4-5
   Red wire S6-P9 to TB4-6
   Black wire S6-P11 to TB4-7
   Yellow wire S6-P10 to TB4-8

WARNING

Avoid breathing fumes generated by soldering. Eye protection is required. Good general ventilation is normally adequate.

5. Solder three wires (1) to thermostat control R1 terminals (2, 3, and 4). Remove wire marker tags.
6. Install wire ties as required.
7. Install front panel assembly (WP 0038 00-21).



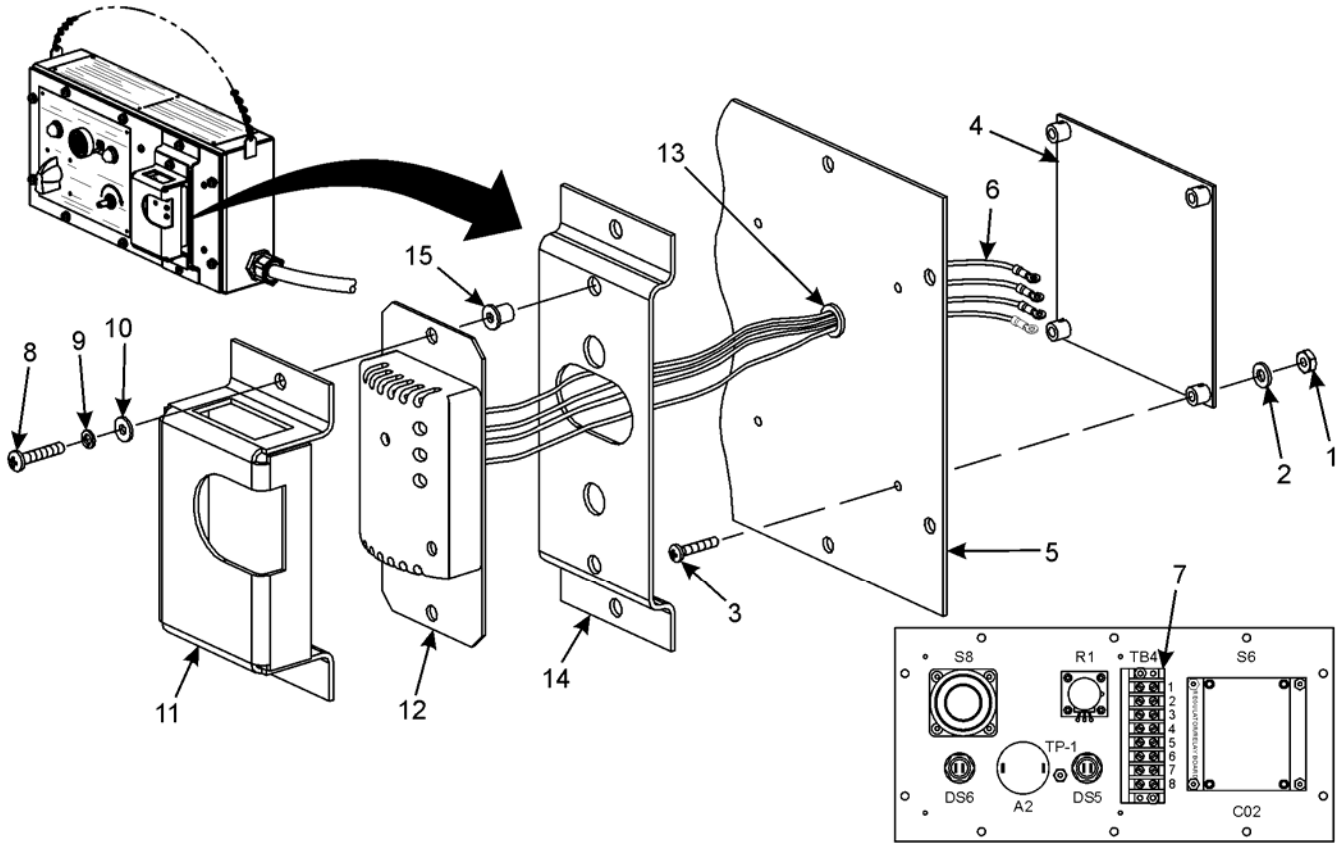
ASSEMBLY – Continued

Carbon Monoxide Detector CO2 Installation

1. Install rivnuts (15) onto bracket (14).
2. Carefully guide wires (6) through bracket (14).
3. Install grommet (13) into front panel assembly (5).
4. Carefully guide wires (6) through grommet (13) and position carbon monoxide detector CO2 (12) onto bracket (14).
5. Install cover (11) with two washers (10), lockwashers (9) (item 27, WP 0062 00), and screws (8).
6. Connect following four wires (6) to terminal board TB4 (7). Remove wire marker tags.

   Red wire to TB4-6
   Black wire and one white wire to TB4-7
   Remaining white wire to TB4-8

7. Install remote controller S6 (4) with four screws (3), washers (2), and nuts (1).
8. Install front panel assembly (WP 0038 00-21).



ASSEMBLY – Continued

Thermostat Control R1 Installation

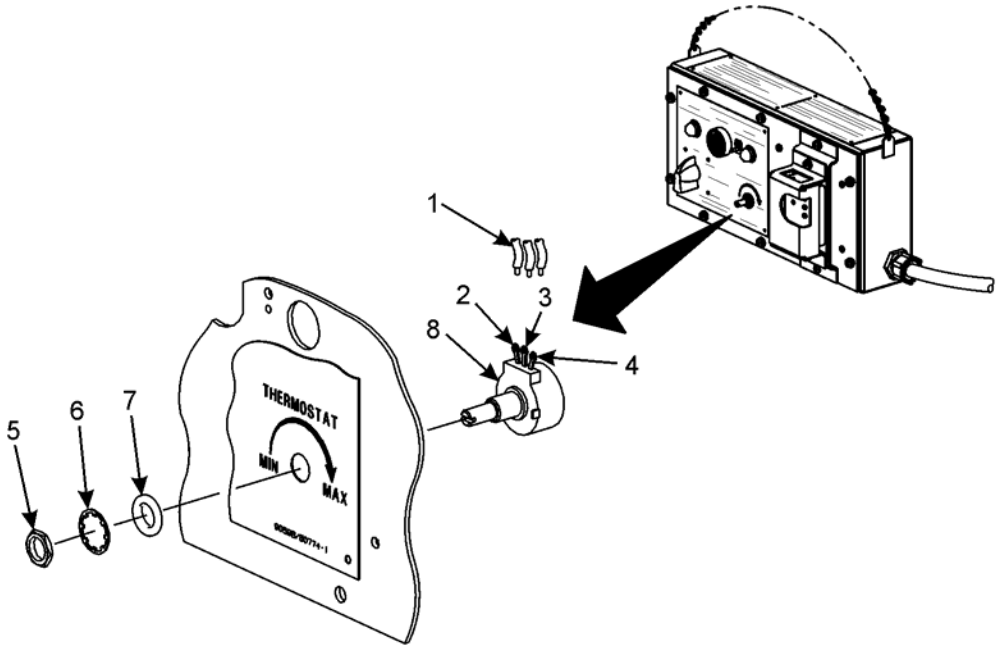
1. Install thermostat control R1 (8), O-ring (7), lockwasher (6), and nut (5).

WARNING

Avoid breathing fumes generated by soldering. Eye protection is required. Good general ventilation is normally adequate.

2. Solder three wires (1) to thermostat control R1 terminals (4, 3, and 2). Remove wire marker tags.

3. Install front panel assembly (WP 0038 00-21).



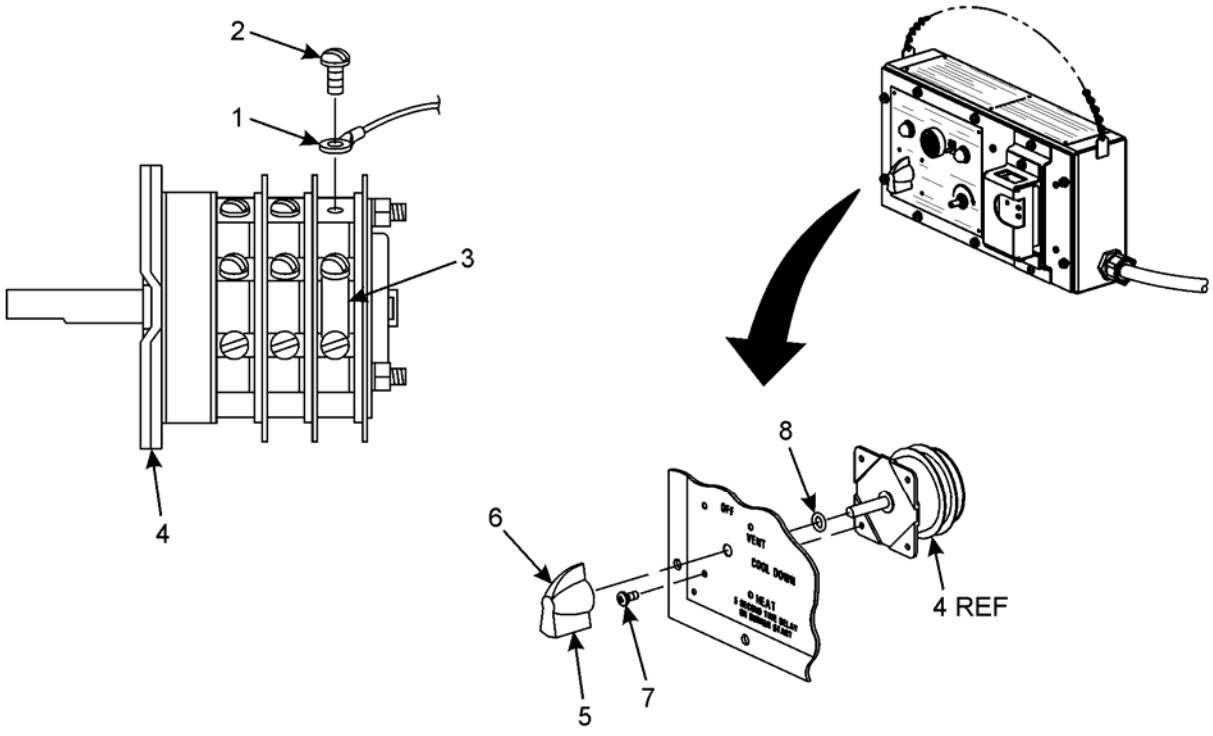
ASSEMBLY – Continued

Mode Switch S8 Installation

1. Install O-ring (8) onto shaft of mode switch S8 (4).
2. Install mode switch S8 (4) with four screws (7).
3. Install knob (6) and tighten setscrew (5).
4. Install following four jumpers (3) and connect wires (1) to mode switch S8 (4) with screws (2). Remove wire marker tags.

   Between S8-21 and S8-31
   Between S8-22 and S8-23
   Between S8-23 and S8-24
   Between S8-33 and S8-34

5. Install front panel assembly (WP 0038 00-21).



ASSEMBLY – Continued

Front Panel Assembly Installation

1. Install connector (13) and nut (12).

2. Slide locknut (10) onto cable (11).

3. Install cable (11) through connector (13). Adjust cable end length as required and tighten locknut (10).

5. Install gasket (8) onto enclosure (9).

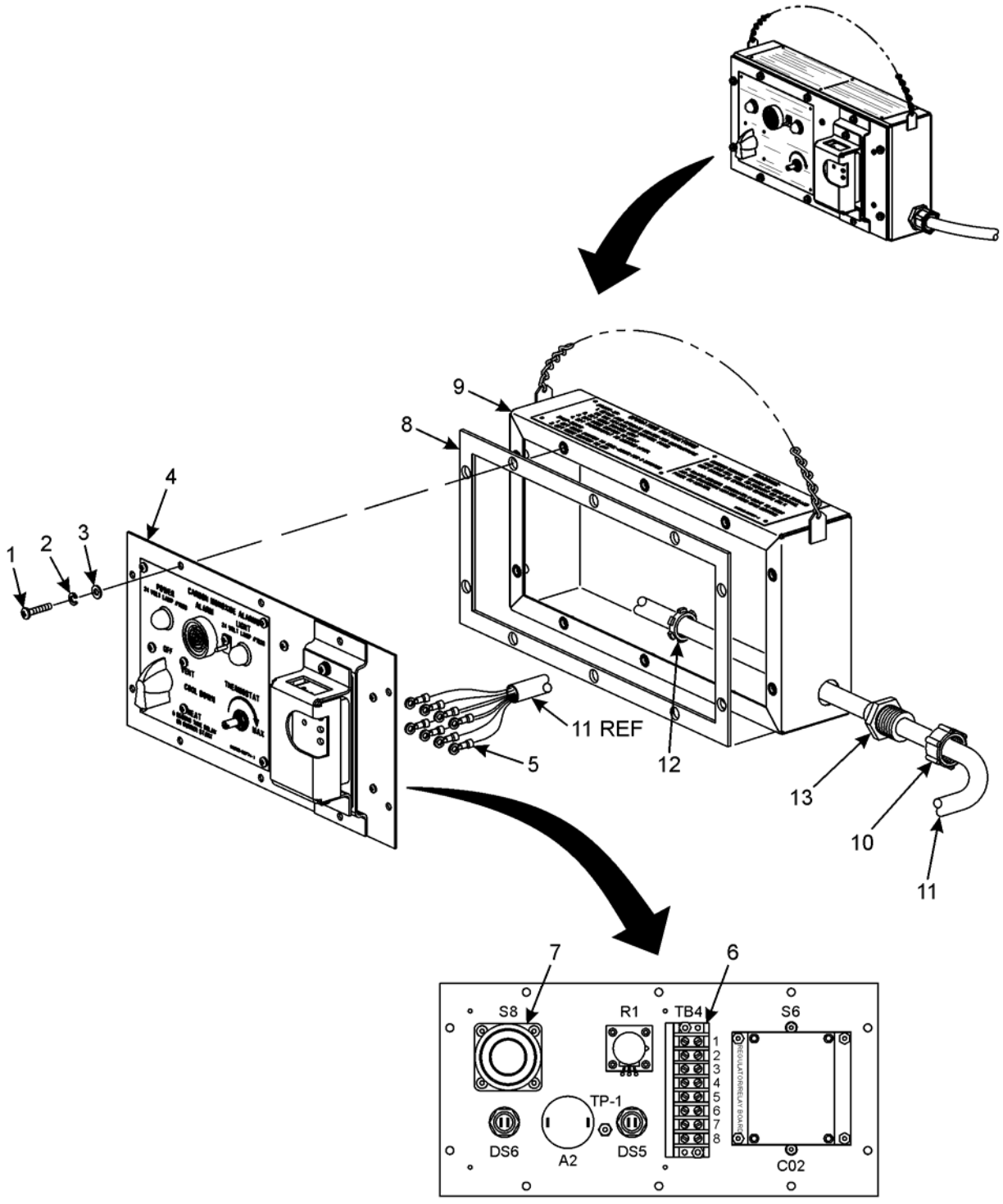
5. Position front panel assembly (4) and connect following eight wires (5) to mode switch S8 (7) and terminal board TB4 (6). Remove wire marker tags.

   Black wire P3-A to S8-31
   White wire P3-B to TB4-3
   Green wire P3-C to TB4 mounting screw
   Red wire P3-D to S8-11
   Blue wire P3-E to TB4-2
   Orange wire P3-F to TB4-5
   Red wire with black stripe P3-G to TB4-1
   White wire with black stripe P3-H to S8-34

6. Install wire ties as required.

7. Install front panel assembly (4) with ten washers (3), lockwashers (2) (item 27, WP 0062 00), and screws (1).

ASSEMBLY – Continued



END OF WORK PACKAGE

UNIT MAINTENANCE INSTRUCTIONS

ARMY SPACE HEATER H-140

NSN 4520-01-477-0568

POWER CABLE ASSEMBLY REMOVAL, INSPECTION, REPAIR, INSTALLATION

INITIAL SETUP:

Test Equipment
None

Tools and Special Tools
Automotive general mechanic's tool kit (item 10, WP 0058 00)
Electrical repair shop set (item 8, WP 0058 00)
Soldering iron (item 8, WP 0058 00)

Personnel Required
One

References
None

Materials/Parts
Acrylic lacquer sealer (item 15, WP 0061 00)
Lockwasher (item 23, WP 0062 00)
O-ring (item 35, WP 0062 00)
Solder (item 23, WP 0061 00)
Wire marker tag (item 25, WP 0061 00)
Wire tie (item 24, WP 0061 00)

Equipment Condition
ASH disconnected from power source (WP 0005 00)

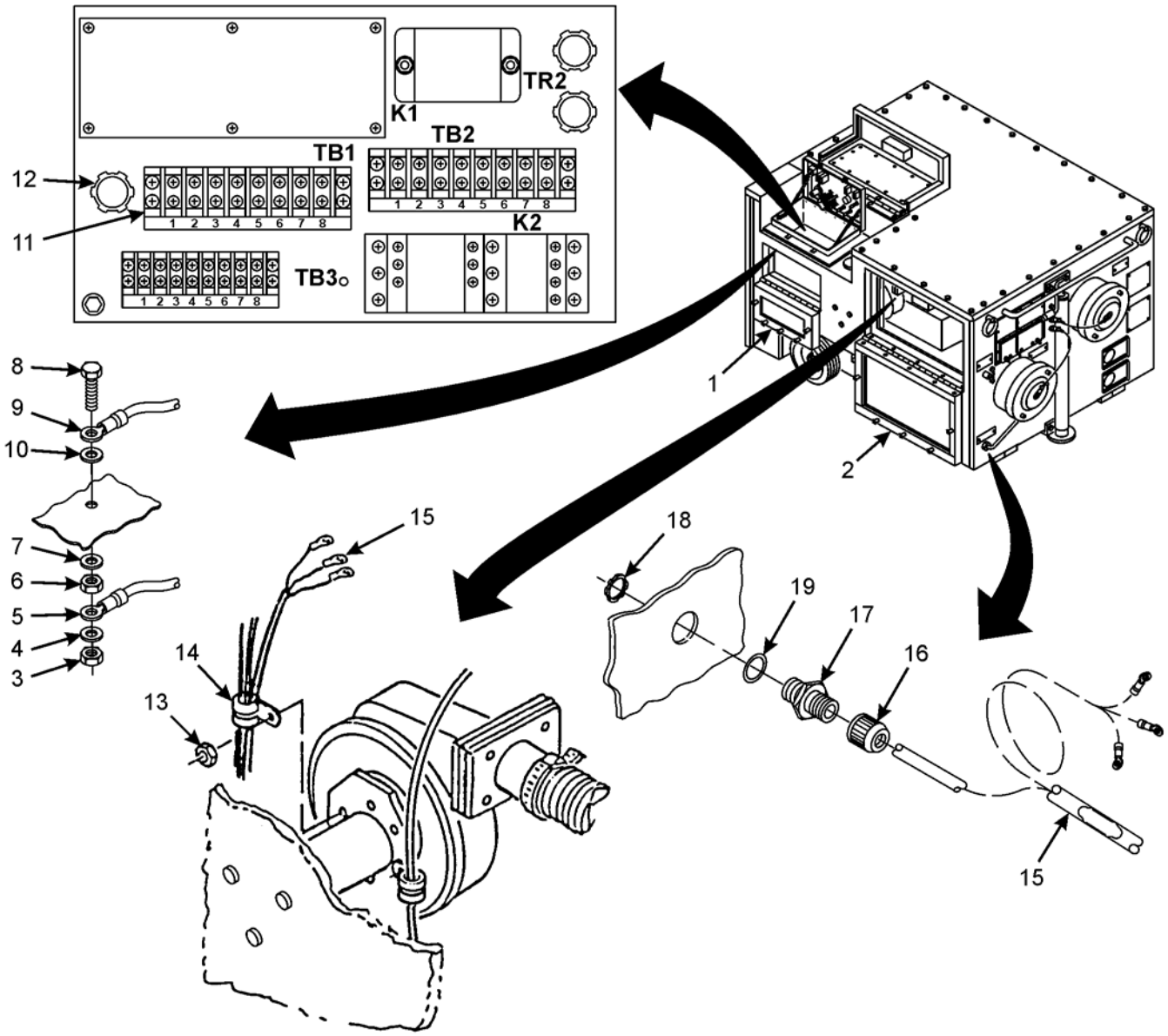
WARNING

Contact with hot components can cause burns. Allow ASH to cool down before attempting service, inspection, or maintenance activity.

REMOVAL

1. Open side rear door (1) and side front door (2).
2. Tag all wires and remove nut (3), lockwasher (4), and wires (5). Discard lockwashers.
3. Remove nut (6), lockwasher (7), ground stud (8), green ground wire P1-C↔G (9), and lockwasher (10). Discard lockwashers.
4. Disconnect black wire P1-A↔TB1-1 and white wire P1-B↔TB1-2 from TB1 (11). Connect remaining wires.
5. Cut wire ties as required.
6. Route wires down through conduit (12).
7. Loosen nut (13) on clamp (14) and route cable (15) through clamp.
8. Loosen locking nut (16) and gently pull power cable (15) through fitting (17).
9. Remove nut (18), fitting (17), and O-ring (19).

REMOVAL – Continued



INSPECTION

1. Inspect connection for secure mounting; burnt, broken, or bent terminals; and corrosion.
2. Inspect cable for cracked, burned, or deteriorated insulation and exposed conductor.
3. Inspect terminal lugs for secure mounting and signs of burning and corrosion.

REPAIR

1. Repair of power cable assembly consists of replacing defective parts.

2. If cable is damaged, replace complete assembly as follows:

   a. Cut strap (1) from connector plug (2) and remove cover (3).

   b. Remove two nuts (4), screws (5), and saddles (6).

   c. Unscrew clamp (7) and slide clamp, grommet follower (8), grommet (9), and rubber bushing (10) down onto cable (11).

   d. Unscrew sleeve (12) from connector plug (2) and slide down onto cable (11).

   e. Tag three wires (13, 14, and 15) and cut connector plug (2) from cable (1).

   f. Slide sleeve (12), rubber bushing (10), grommet (9), grommet follower (8), and clamp (7) from cable (11).

   g. Slide cable clamp (7), grommet follower (8), grommet (9), rubber bushing (10), and sleeve (12) onto cable (11).

   h. Strip 0.75 inch (1.9 cm) of insulation from cable (11) to expose three wires (13, 14, and 15).

WARNING

Avoid breathing fumes generated by soldering. Eye protection is required. Good general ventilation is normally adequate.

   i. Strip 0.25 inch (0.6 cm) of insulation from three wires (13, 14, and 15). Solder following three wires into connector plug (2) pins. Remove wire marker tags.

   Black wire P1-A↔TB1-1 to pin A
   White wire P1-B↔TB1-2 to pin B
   Green wire P1-C↔G1 to pin C

NOTE

Hold the connector plug tight while turning the sleeve to prevent twisting of wires.

   j. Hold connector plug (2) tight and slide sleeve (12) up cable (11) and screw sleeve onto connector plug (2).

   k. Slide rubber bushing (10), grommet (9), grommet follower (8), and clamp (7) up cable (11) and screw clamp onto sleeve (12).

NOTE

Rubber bushing should bulge slightly when the saddles are tight.

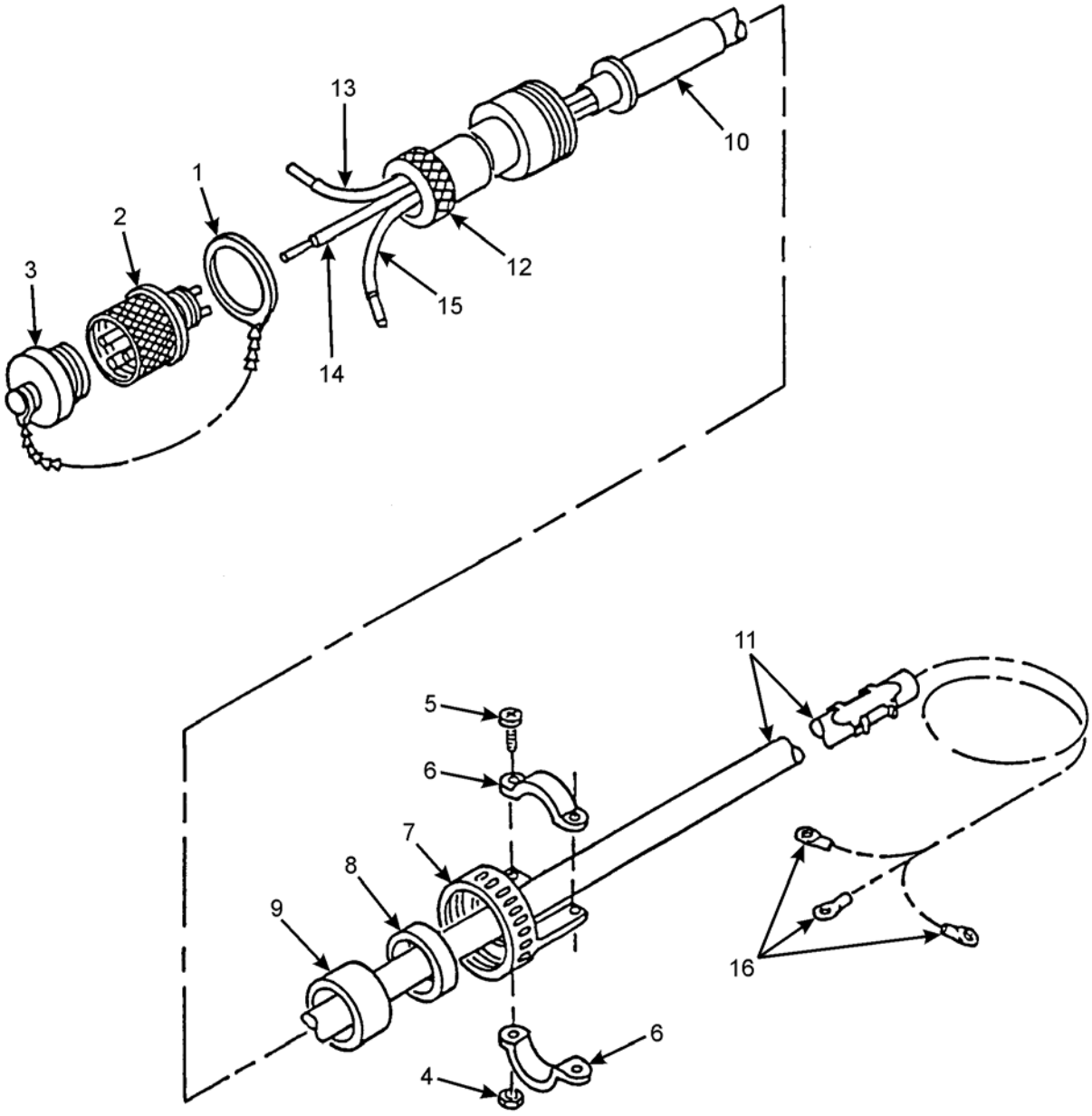
   l. Position two saddles (6) on clamp (7) with two screws (5) and nuts (4).

   m. Insert strap (1) through end of chain on cover (3) and install onto connector plug (2).

REPAIR – Continued

n. Screw cover (3) into connector plug (2).

o. Repair of other end of cable is limited to replacement of terminal lugs (16).



INSTALLATION

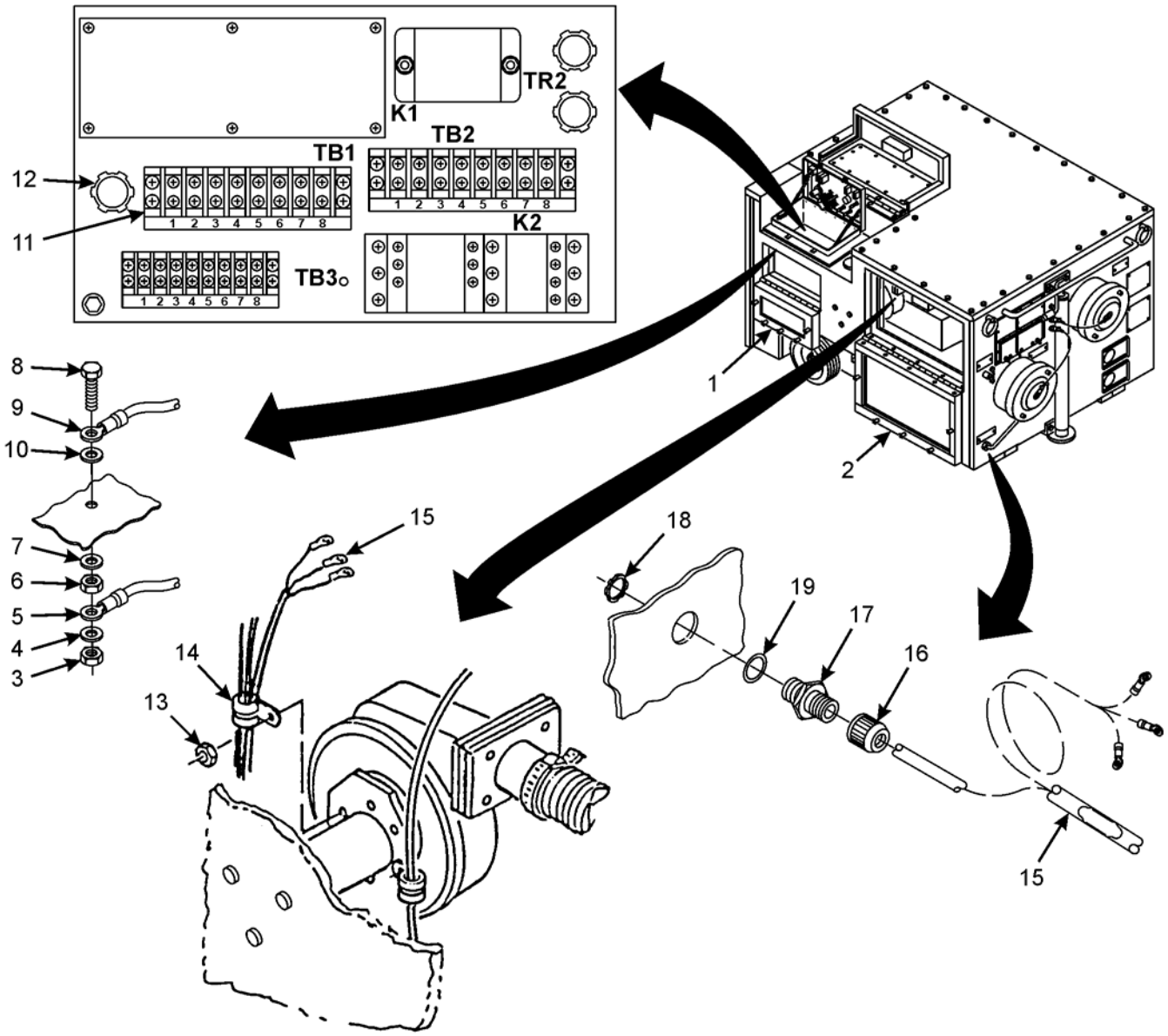
1. Install O-ring (19) onto fitting (17).
2. Install fitting (17) and nut (18).
3. Insert power cable (15) through fitting (17).
4. Route power cable (15) along bottom of ASH to clamp (14).
5. Route cable (15) through clamp (14) and up through conduit (12). Allow enough slack to attach three wires to terminal board TB1 (11) and ground stud (8). Tighten nut (13) and locking nut (16).
6. Connect white wire P1-B↔TB1-2 and black wire P1-A↔TB1-1 to TB1 (11). Remove wire marker tags.
7. Install lockwasher (10), green ground wire P1-C↔G (9) and remaining wires, ground stud (8), lockwasher (7), and nut (6). Remove wire marker tags.
8. Install wire ties as required
9. Install wires (5), lockwasher (4), and nut (3).

WARNING

Acrylic lacquer sealant is flammable. Keep away from open flames or other sources of ignition. Avoid breathing fumes from sealant. Good general ventilation is normally adequate. Avoid skin contact with sealant.

10. Apply light coat of acrylic lacquer sealer to terminal board TB1 terminals and ground stud (8) connections.
11. Close side front door (2) and side rear door (1).

INSTALLATION – Continued



END OF WORK PACKAGE

UNIT MAINTENANCE INSTRUCTIONS

ARMY SPACE HEATER H-140

NSN 4520-01-477-0568

POWER CABLE ADAPTER REPAIR

INITIAL SETUP:

Test Equipment
None

Tools and Special Tools
Automotive general mechanic's tool kit (item 10, WP 0058 00)
Electrical repair shop set (item 8, WP 0058 00)
Soldering iron (item 8, WP 0058 00)

Personnel Required
One

References
None

Materials/Parts
Solder (item 23, WP 0061 00)
Wire marker tag (item 25, WP 0061 00)
Wire tie (item 24, WP 0061 00)

Equipment Condition
ASH disconnected from power source (WP 0005 00)

REPAIR

1. Repair of power cable adapter consists of replacing defective parts.
2. If cable is damaged, replace cable as follows:
   a. Cut strap (1) from connector plug (2) and remove cover (3).
   b. Remove two nuts (4), screws (5), and saddles (6).
   c. Unscrew clamp (7) and slide clamp, grommet follower (8), grommet (9), and rubber bushing (10) down onto cable (11).
   d. Unscrew sleeve (12) from connector plug (2) and slide down onto cable (11).
   e. Tag three wires (13) and cut connector plug (2) from cable (11).
   f. Cut wire tie (14) from cable (11).
   g. Slide sleeve (12), rubber bushing (10), grommet (9), grommet follower (8), and clamp (7) from cable (11).
   h. Slide clamp (7), grommet follower (8), grommet (9), rubber bushing (10), and sleeve (12) onto cable (11).

REPAIR – Continued

WARNING

Avoid breathing fumes generated by soldering. Eye protection is required. Good general ventilation is normally adequate.

i. Strip 0.25 inch (0.6 cm) of insulation from three wires (13). Solder following three wires into connector plug (2) pins. Remove wire marker tags.

Black wire to pin A
White wire to pin B
Green wire to pin C

NOTE

Hold the connector plug tight while turning the sleeve to prevent twisting of wires.

j. Hold connector plug (2) tight and slide sleeve (12) up cable (11) and screw sleeve onto connector plug (2).

k. Slide rubber bushing (10), grommet (9), grommet follower (8), and clamp (7) up cable (11) and screw clamp onto sleeve (12).

NOTE

Rubber bushing should bulge slightly when the saddles are tight.

l. Position two saddles (6) on clamp (7) with two screws (5) and nuts (4).

m. Insert strap (1) through end of chain on cover (3) and install onto connector plug (2).

n. Screw cover (3) onto connector plug (2).

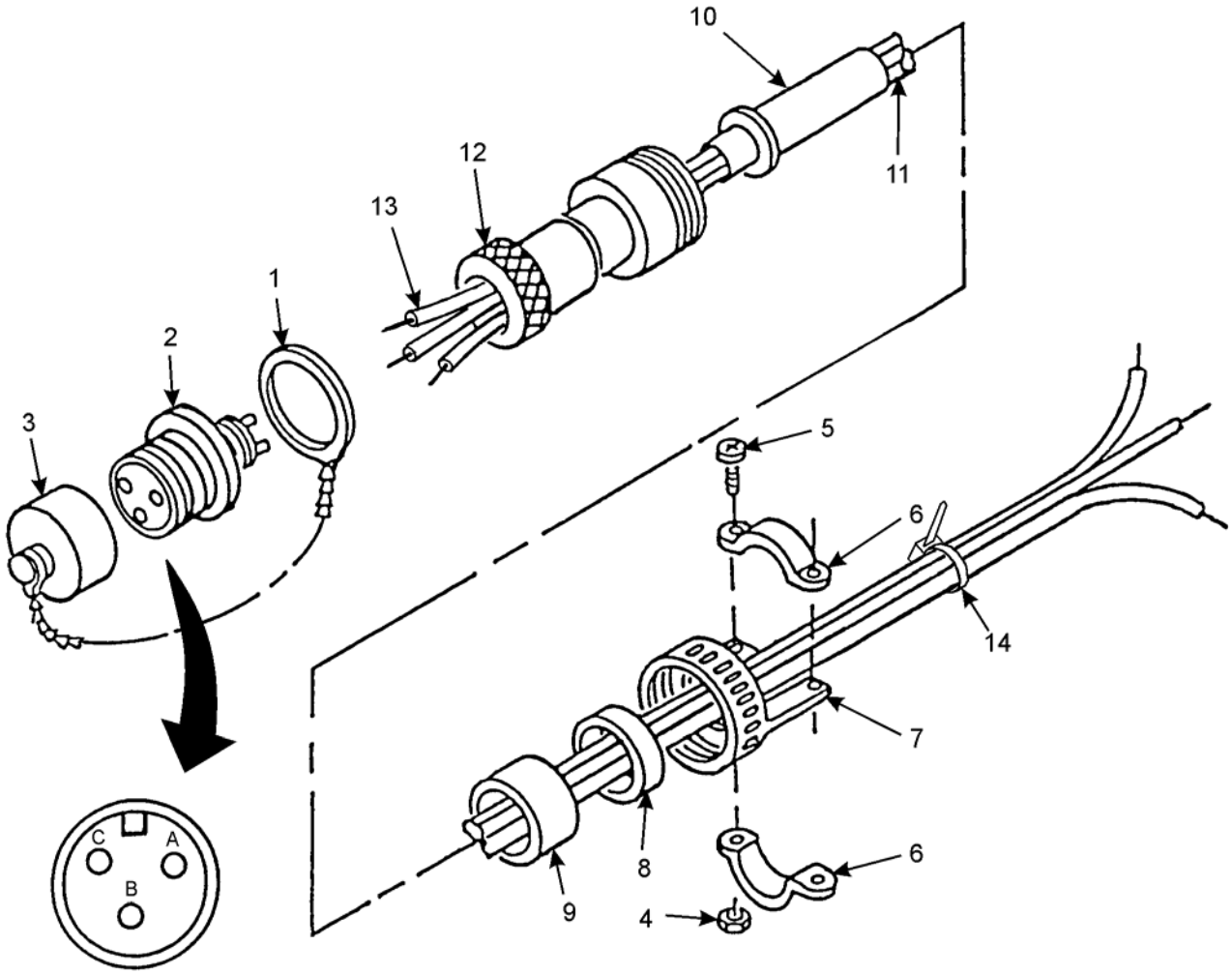
WARNING

Avoid breathing fumes generated by soldering. Eye protection is required. Good general ventilation is normally adequate.

o. Repair of other end of cable is limited to stripping of insulation to expose 0.25 inch (0.6 cm) of wire and tinning each end with solder.

p. Install wire tie (14) onto cable (11) 8 to 14 inches (20.3 to 35.6 cm) from tinned end of cable.

REPAIR – Continued



END OF WORK PACKAGE

UNIT MAINTENANCE INSTRUCTIONS

ARMY SPACE HEATER H-140

NSN 4520-01-477-0568

CABINET REMOTE CONTROL BOX CABLE J3 ASSEMBLY REMOVAL, REPAIR, INSTALLATION

INITIAL SETUP:

Test Equipment
None

Tools and Special Tools
Automotive general mechanic's tool kit (item 10, WP 0058 00)
Blind riveter (item 2, WP 0058 00)
Crimping tool (item 6, WP 0058 00)
Drill (item 6, WP 0058 00)
Drill bit (item 6, WP 0058 00)

Personnel Required
One

References
None

Materials/Parts
Grommet (item 1, WP 0047 00)
Lockwasher (item 25, WP 0062 00)
Rivet (item 6, WP 0062 00)
Sealing compound (item 16, WP 0061 00)
Wire marker tag (item 25, WP 0061 00)
Wire tie (item 24, WP 0061 00)

Equipment Condition
ASH disconnected from power source (WP 0005 00)

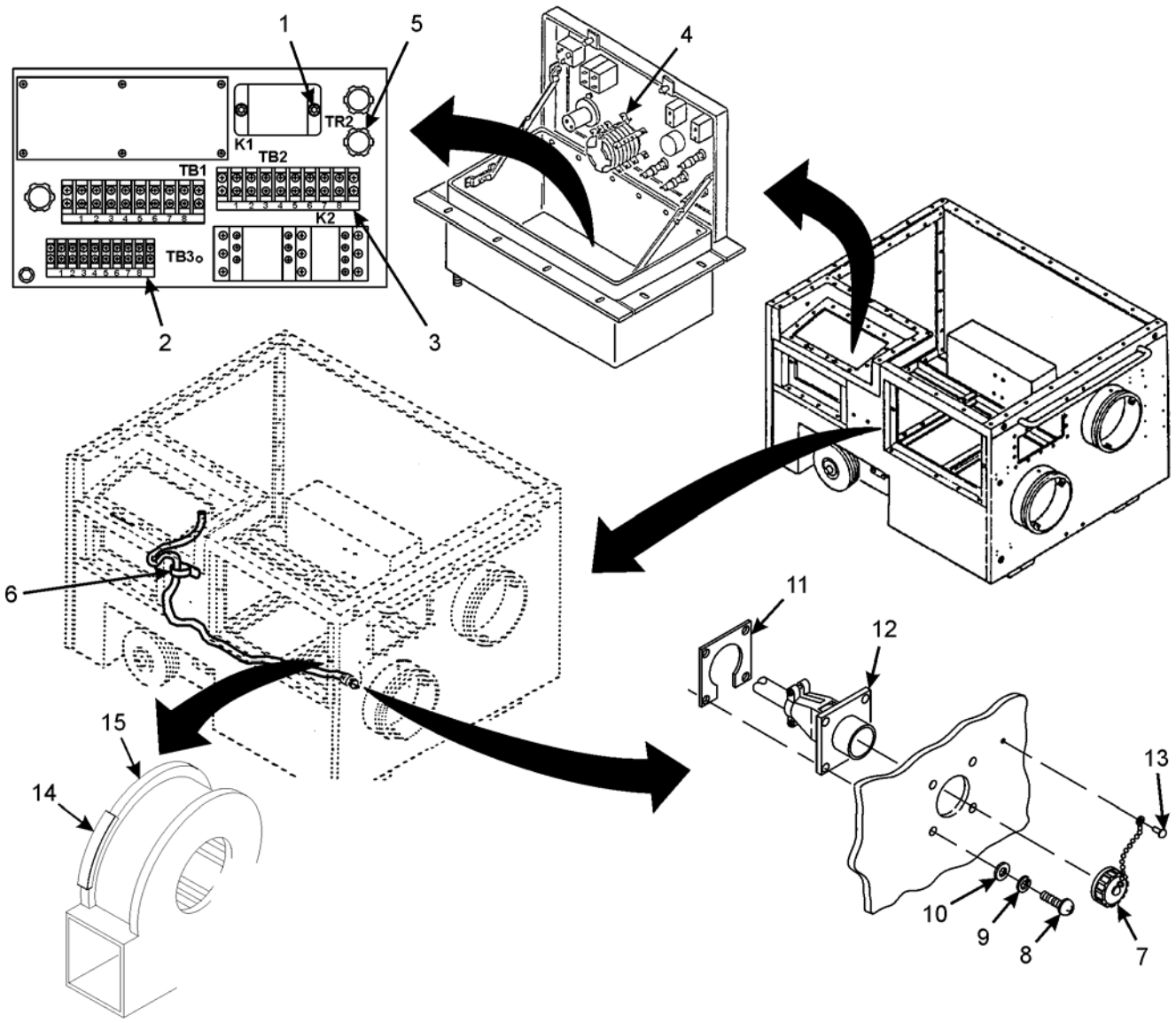
WARNING

Contact with hot components can cause burns. Allow ASH to cool down before attempting service, inspection, or maintenance activity.

REMOVAL

1. Tag and disconnect green wire GND/J2-G from transformer TR2 mounting screw (1).
2. Tag and disconnect four wires J3-E/TB3-4, J3-F/TB3-7, J3-G/TB3-5, and J3-H/TB3-6 from terminal board TB3 (2).
1. Tag and disconnect wire J3-B/TB2-2 from terminal board TB2 (3) and two wires J3-A/S1-67 and J3-D/S1-57 from MODE SWITCH S1 (4).
2. Cut wire ties as required.
3. Route wires down through conduit (5) and through clamp (6).
4. Remove dust cover (7), four screws (8), lockwashers (9), washers (10), nut plate (11), and connector (12) with attached cable. Discard lockwashers.
5. Drill out rivet (13) and remove dust cover (7).
6. Remove grommet (14) from ventilation air fan housing (15). Discard grommet.

REMOVAL – Continued



REPAIR

1. Repair of cable assembly J3 consists of replacing defective parts.

2. If cable is damaged, replace complete cable assembly J3 as follows:

   a. Remove two screws (1) and saddles (2).

   b. Unscrew clamp (3) and slide clamp and sleeve (4) down onto cable (5).

   c. Tag eight wires (6) and cut connector receptacle (7) from cable (5).

   d. Slide sleeve (4) and clamp (3) from cable (5).

   e. Slide cable clamp (3) and sleeve (4) onto cable (5).

   f. Strip 0.75 inch (1.9 cm) of insulation from cable (5) to expose eight wires (6).

   g. Strip 0.25 inch (0.6 cm) of insulation from eight wires (6).

   h. Crimp connector receptacle (7) pins to eight wires (6).

   i. Insert following eight connector receptacle (7) pins. Remove wire marker tags.

      Black wire to pin A
      White wire to pin B
      Green wire to pin C
      Red wire to pin D
      Blue wire to pin E
      Orange wire to pin F
      Brown wire to pin G
      Grey wire to pin H

NOTE

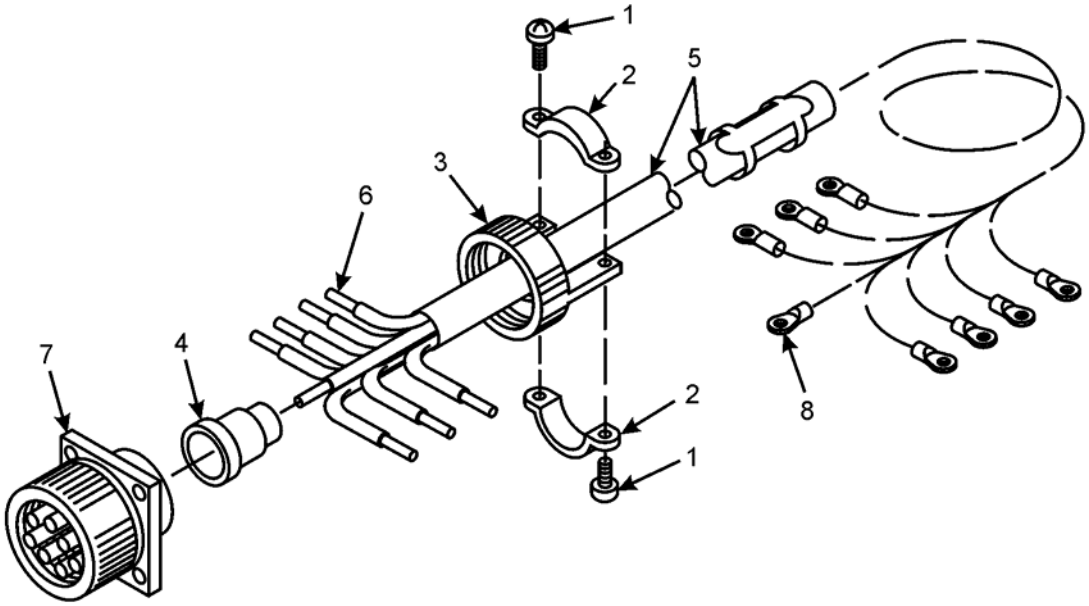
Hold the connector receptacle tight while turning the clamp to prevent twisting of wires.

   j. Hold connector receptacle (7) tight and slide sleeve (4) and clamp (3) up cable (5) and screw clamp (3) onto connector receptacle.

   k. Position two saddles (2) on clamp (3) and install with two screws (1).

   l. Repair of other end of cable is limited to replacement of terminal lugs (8).

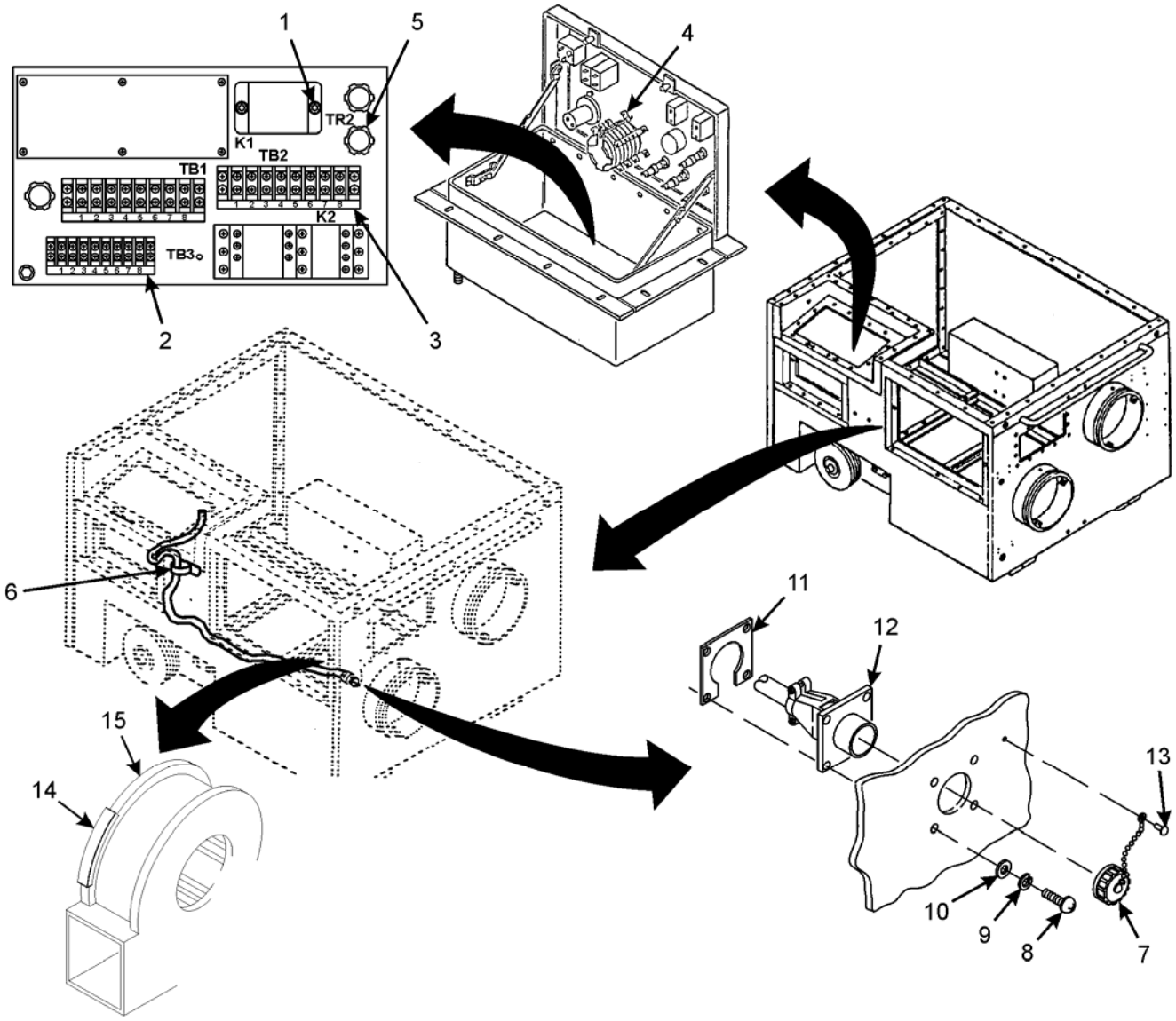
REPAIR – Continued



INSTALLATION

1. Apply sealing compound to ventilation air fan housing (15) edge and install grommet (14).
2. Install dust cover (7) with rivet (13).
3. Install connector (12), nut plate (11), four washers (10), lockwashers (9), and screws (8) and install dust cover (7) onto connector.
4. Route cable along body of ASH through clamp (6) and up through conduit (5).
5. Connect red wire J3-D/S1-57 and black wire J3-A/S1-67 to MODE SWITCH S1 (4) and white wire J3-B/TB2-2 to terminal board TB2 (3). Remove wire marker tags.
6. Connect white/black wire J3-H/TB3-6, red/black wire J3-G/TB3-5, orange wire J3-F/TB3-7, and blue wire J3-E/TB3-4 to terminal board TB3 (2). Remove wire marker tags.
7. Connect green wire GND/J3-C to transformer TR2 mounting screw (1). Remove wire marker tag.
8. Install wire ties as required.

INSTALLATION



END OF WORK PACKAGE

UNIT MAINTENANCE INSTRUCTIONS

ARMY SPACE HEATER H-140

NSN 4520-01-477-0568

JACK ASSEMBLY REMOVAL, INSTALLATION

INITIAL SETUP:

Test Equipment
None

Tools and Special Tools
Automotive general mechanic's tool kit (item 10, WP 0058 00)

Personnel Required
One

References
None

Materials/Parts
Lockwasher (item 28, WP 0062 00)

Equipment Condition
Stow wheel assemblies (WP 0015 00)

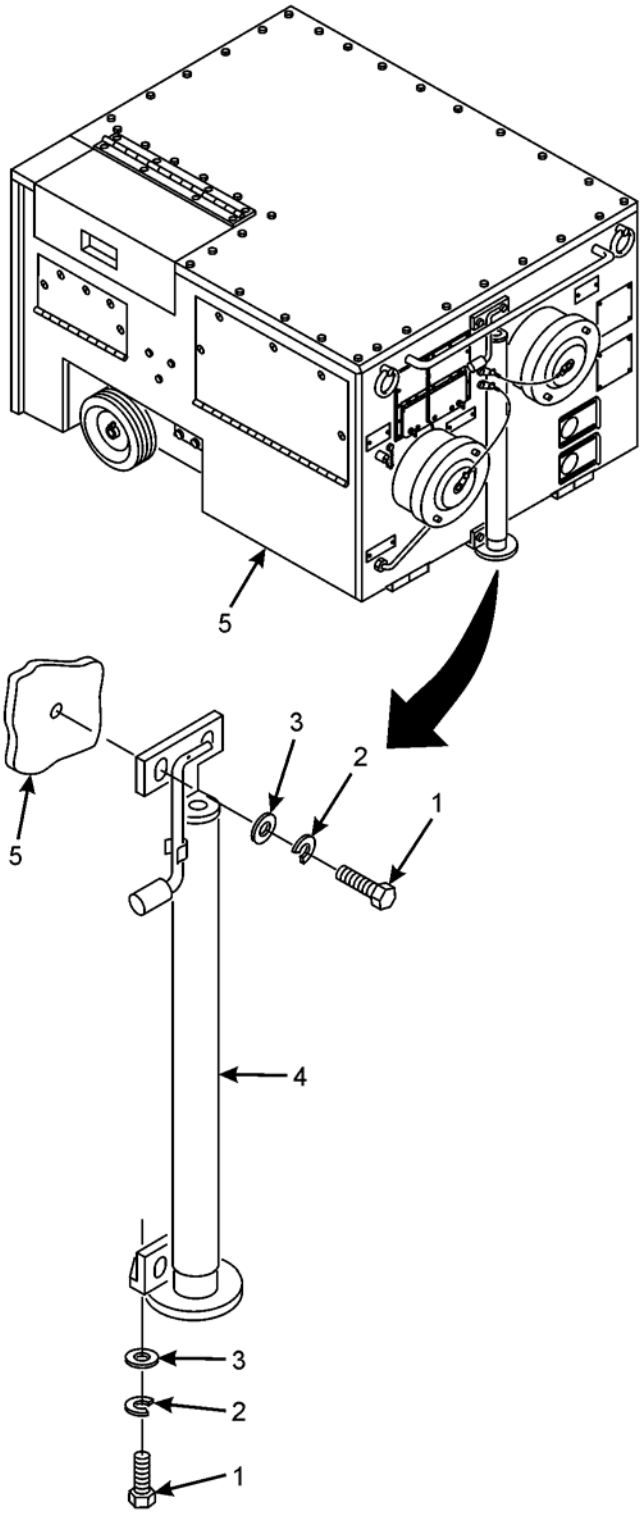
WARNING

Contact with hot components can cause burns. Allow ASH to cool down before attempting service, inspection, or maintenance activity.

REMOVAL

1. Remove screw (1), lockwasher (2), and washer (3) from bottom of jack assembly (4). Discard lockwasher.
2. Remove four screws (1), lockwashers (2), and washers (3) from front of jack assembly (4) and remove jack assembly from frame (5). Discard lockwashers.

REMOVAL – Continued



INSTALLATION

1. Position jack assembly (4) onto frame (5) and install four washers (3), lockwashers (2), and screws (1) onto front of jack assembly.

2. Install washer (3), lockwasher (2), and screw (1) onto bottom of jack assembly (4).

END OF WORK PACKAGE

UNIT MAINTENANCE INSTRUCTIONS

ARMY SPACE HEATER H-140

NSN 4520-01-477-0568

WHEEL ASSEMBLIES REMOVAL, REPAIR, INSTALLATION

INITIAL SETUP:

Test Equipment
None

Tools and Special Tools
Automotive general mechanic's tool kit (item 10, WP 0058 00)

Personnel Required
One

References
None

Materials/Parts
Automotive and artillery grease (item 10, WP 0061 00)
Cotter pin (item 18, WP 0062 00)
Cotter pin (item 19, WP 0062 00)
Quick-release pin assembly (item 2, WP 0047 00)

Equipment Condition
Stow wheel assemblies (WP 0015 00)

WARNING

Contact with hot components can cause burns. Allow ASH to cool down before attempting service, inspection, or maintenance activity.

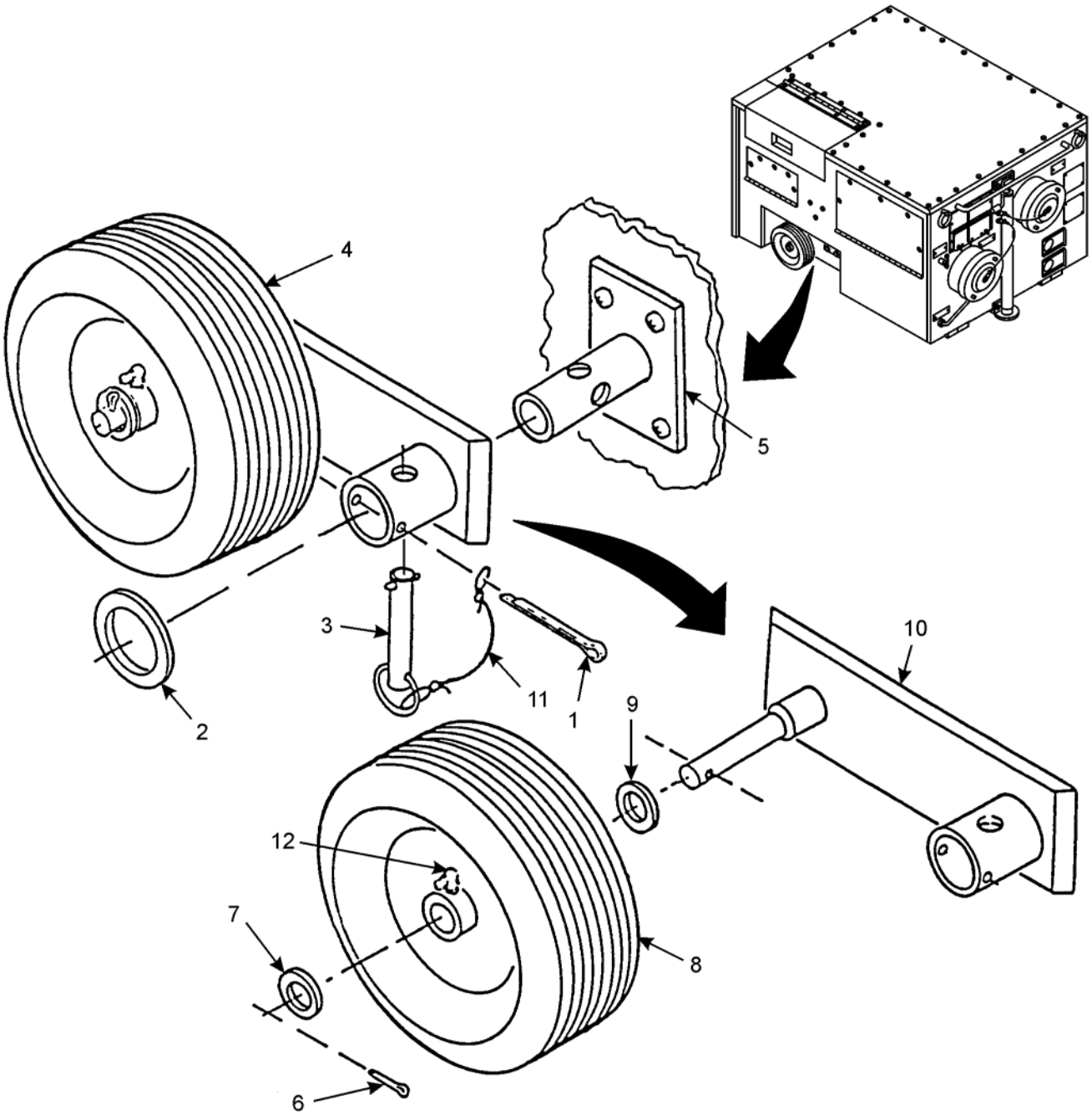
NOTE

Procedures are typical for both wheel assemblies.

REMOVAL

1. Remove cotter pin (1) and washer (2). Discard cotter pin.
2. Remove quick-release pin assembly (3) and wheel assembly (4) from pivot (5).
3. Remove cotter pin (6), washer (7), wheel (8), and washer (9) from arm (10). Discard cotter pin.
4. Remove quick-release pin assembly (3) and cotter pin (1) from cable (11) only if replacement is required.

REMOVAL – Continued



REPAIR

Repair is limited to replacement of defective parts.

INSTALLATION

1. Install cotter pin (1) (item 19, WP 0062 00) onto cable (11) of quick-release pin assembly (3).
2. Install washer (9), wheel (8), washer (7), and cotter pin (6) (item 18, WP 0062 00) onto arm (10).
3. Install wheel assembly (4) onto pivot (5) and install quick-release pin assembly (3).
4. Install washer (2) and cotter pin (1) and service grease fitting (12) with automotive and artillery grease.

END OF WORK PACKAGE

UNIT MAINTENANCE INSTRUCTIONS

ARMY SPACE HEATER H-140

NSN 4520-01-477-0568

FRESH AIR DAMPER ASSEMBLY DISASSEMBLY, REPAIR, ASSEMBLY

INITIAL SETUP:

Test Equipment
None

Tools and Special Tools
Automotive general mechanic's tool kit (item 10, WP 0058 00)
Gasket punch (item 6, WP 0058 00)
Shears (item 6, WP 0058 00)

Personnel Required
One

References
None

Materials/Parts
Chain (item 61, WP 0047 00)
Gasket (item 62, WP 0047 00)
Gasket (item 63, WP 0047 00)
Lockwasher (item 27, WP 0062 00)

Equipment Condition
ASH disconnected from power source (WP 0005 00)

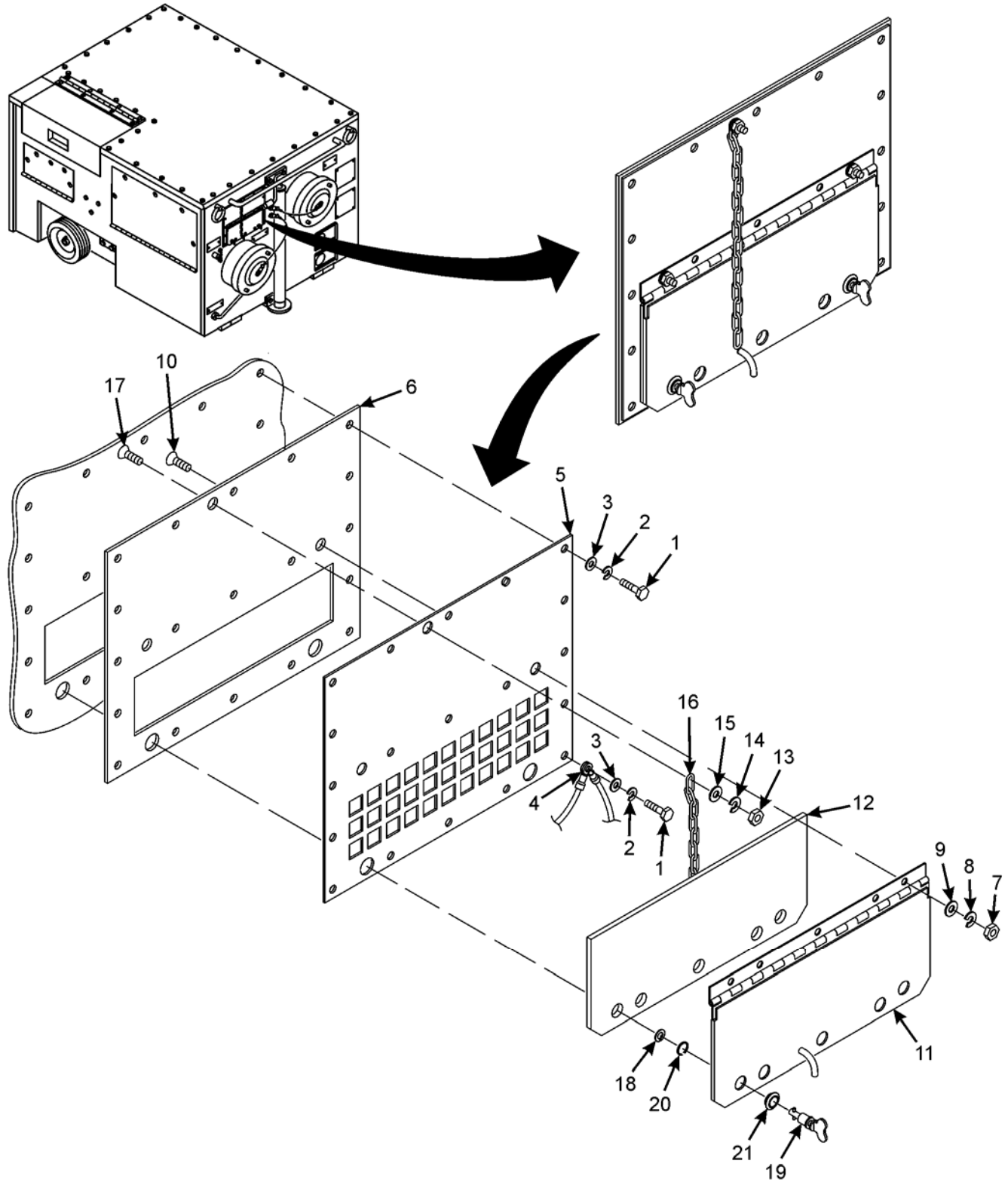
WARNING

Contact with hot components can cause burns. Allow ASH to cool down before attempting service, inspection, or maintenance activity.

DISASSEMBLY

1. Remove 19 screws (1), lockwashers (2), washers (3), two cables (4), fresh air damper assembly (5), and gasket (6). Discard lockwashers.
2. Remove two nuts (7), lockwashers (8), washers (9), screws (10), and door assembly (11). Discard lockwashers.
3. Remove gasket (12) from door assembly (11).
4. Remove nut (13), lockwasher (14), washer (15), chain (16), and screw (17). Discard lockwasher and chain.
5. Remove two stud retainer rings (18) and studs (19).
6. Remove two retainer rings (20) and grommets (21).

DISASSEMBLY – Continued



REPAIR

Repair is limited to replacement of defective parts.

ASSEMBLY

1. Install two grommets (21) and retainer rings (20).
2. Install two studs (19) and stud retainer rings (18).
3. Install screw (17), chain (16), washer (15), lockwasher (14), and nut (13).
4. Install gasket (12) (item 63, WP 0047 00) onto door assembly (11).
5. Install door assembly (11), two screws (10), washers (9), lockwashers (8), and nuts (7).
6. Install gasket (6) (item 62, WP 0047 00) onto fresh air damper assembly (5).
7. Position fresh air damper assembly (5) and install with two cables (4), 19 washers (3), lockwashers (2), and screws (1).

END OF WORK PACKAGE

UNIT MAINTENANCE INSTRUCTIONS

ARMY SPACE HEATER H-140

NSN 4520-01-477-0568

CABINET ASSEMBLY
DISASSEMBLY, REPAIR, ASSEMBLY

INITIAL SETUP:

Test Equipment
None

Tools and Special Tools
Automotive general mechanic's tool kit (item 10, WP 0058 00)
Blind riveter (item 2, WP 0058 00)
Drill (item 6, WP 0058 00)
Drill bit (item 6, WP 0058 00)
Rivnut tool (item 3, WP 0058 00)

Personnel Required
One

References
None

Materials/Part
Cotter pin (item 17, WP 0062 00)
Lockwasher (item 27, WP 0062 00)
Rivet (item 3, WP 0062 00)
Rivnut (item 12, WP 0062 00)

Equipment Condition
ASH disconnected from power source (WP 0005 00)

WARNING

Contact with hot components can cause burns. Allow ASH to cool down before attempting service, inspection, or maintenance activity.

DISASSEMBLY

1. Remove four screws (1), lockwashers (2), washers (3), and handbook compartment (4). Discard lockwashers.

2. Drill out four rivnuts (5).

NOTE

Information plates are attached using two or four rivets each. Remove the quantity of rivets the configuration requires.

3. Drill out rivets (6) as required and remove following six information plates:

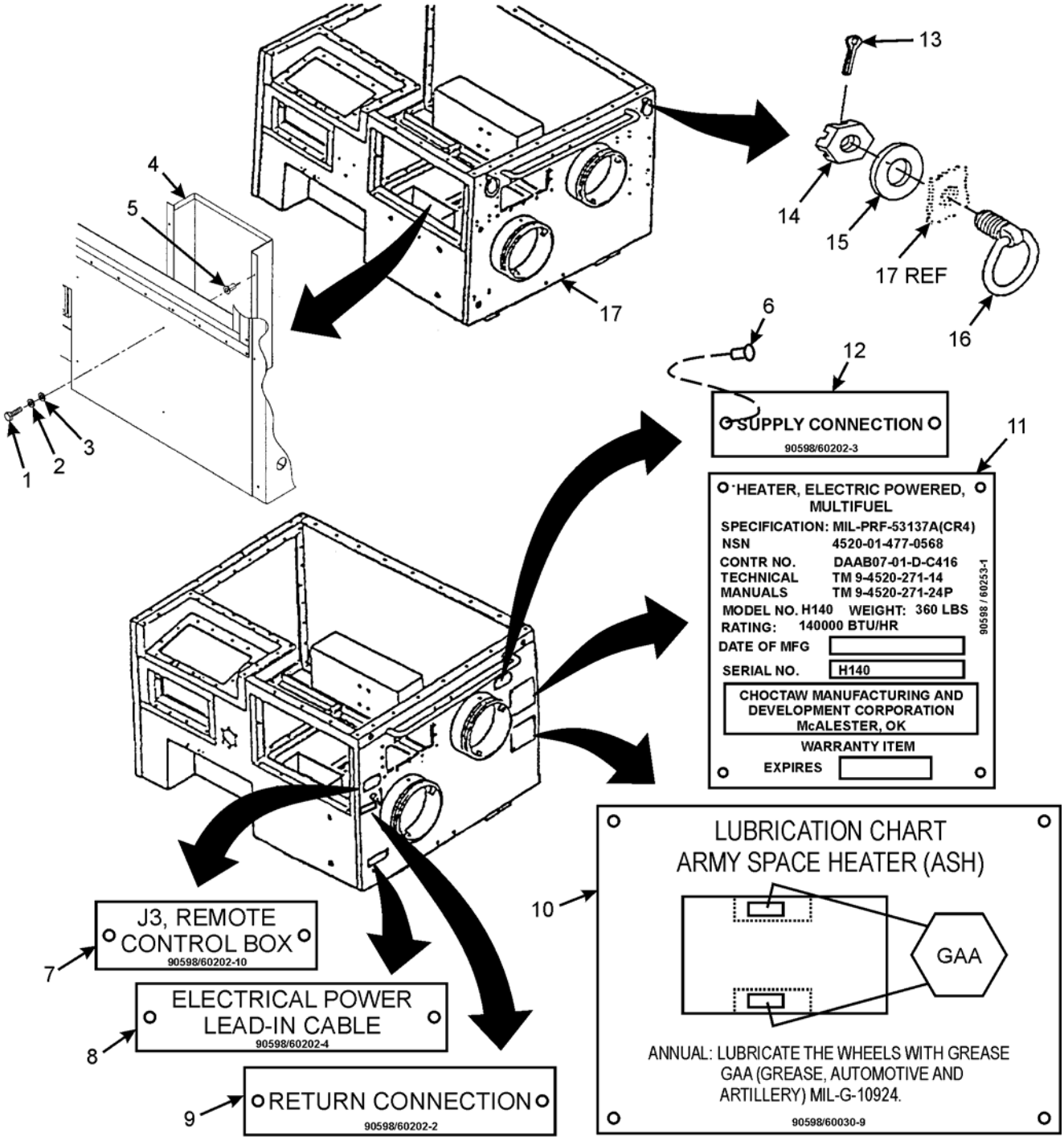
J3, REMOTE CONTROL BOX (7)
ELECTRICAL POWER LEAD-IN CABLE (8)
RETURN CONNECTION (9)
LUBRICATION CHART (10)
HEATER, ELECTRIC POWERED, MULTIFUEL (11)
SUPPLY CONNECTION (12)

NOTE

Procedures are typical for each of the four tiedown rings.

4. Remove cotter pin (13), slotted nut (14), washer (15), and tiedown ring (16) from frame (17).

DISASSEMBLY – Continued



REPAIR

Repair is limited to replacement of defective parts.

ASSEMBLY

NOTE

Procedures are typical for each of the four tiedown rings.

1. Install tiedown ring (16) with washer (15) and slotted nut (14) onto frame (17). Handtighten only.
2. Loosen slotted nut (14) until tiedown ring (16) swivels freely and install cotter pin (13).

NOTE

Information plates are attached using two or four rivets. Install the quantity of rivets the configuration requires.

3. Install following six information plates with rivets (6) as required:

   SUPPLY CONNECTION (12)
   HEATER, ELECTRIC POWERED, MULTIFUEL (11)
   LUBRICATION CHART (10)
   RETURN CONNECTION (9)
   ELECTRICAL POWER LEAD-IN CABLE (8)
   J3, REMOTE CONTROL BOX (7)

4. Install four rivnuts (5).
5. Install handbook compartment (4) with four washers (3), lockwashers (2), and screws (1).

END OF WORK PACKAGE

UNIT MAINTENANCE INSTRUCTIONS

ARMY SPACE HEATER H-140

NSN 4520-01-477-0568

PREPARATION FOR STORAGE OR SHIPMENT

INITIAL SETUP:

Test Equipment
None

Tools and Special Tools
Automotive general mechanic's tool kit (item 10, WP 0058 00)
Face Shield (item 6, WP 0058 00)
Leather gloves (item 6, WP 0058 00)

Personnel Required
Two

References
WP 0005 00
WP 0008 00

References – Continued
WP 0018 00
WP 0019 00
WP 0024 00
AR 190-13
AR 190-16
FM 10-67-1

Materials/Part
None

Equipment Condition
None

SECURITY PROCEDURES

Refer to AR 190-13 or AR 190-16.

PREPARATION FOR MOVEMENT

WARNING

Contact with hot components can cause burns. Allow ASH to cool down before attempting service, inspection, or maintenance activity.

Use care when using the jack assembly or when raising or lowering the wheel assemblies. Fingers or hands may be pinched causing injury to personnel.

FOR FUEL SPILLS, REFER TO FM 10-67-1, CONCEPTS AND EQUIPMENT OF PETROLEUM OPERATIONS.

Fuel is flammable and toxic to eyes, skin, and respiratory tract. Skin/eye protection is required. Avoid repeated/prolonged contact. Use only in well-ventilated areas. Keep away from open flames or other sources of ignition. Post FUEL FLAMMABLE/NO SMOKING signs around the area. Be sure a fire extinguisher is available.

Fuel on clothing can be fatal if ignited by a static discharge. If fuel gets on clothes, leave the refueling area as soon as possible, remove clothes, and wash skin with warm, soapy water before getting dressed.

Spilled fuel creates a flammable, vapor-air mixture and fire can take place. Improper positioning of external fuel source can cause fuel tank to overflow. Stop refueling immediately if fuel spill occurs.

PREPARATION FOR MOVEMENT – Continued

CAUTION

Do not set up the ASH on extremely unleveled terrain (greater than 10 degrees (178 mils)) from true horizontal position). Improper operation or damage to equipment may result.

1. Perform shutdown procedures (WP 0005 00) and disconnect power cable from power cable adapter. Wrap power cable around supply and return air duct openings.

2. Disconnect supply and return air hose assemblies (WP 0019 00) and stow hoses in storage containers. Install supply and return duct cover assemblies (WP 0024 00).

3. Disconnect and stow remote control box (WP 0008 00).

4. Remove and stow exhaust pipe and elbow (WP 0008 00). Install exhaust pipe cover (WP 0018 00).

5. Dispose of contaminated fuel per FM 10-67-1.

6. If used, disconnect external fuel hose and drain residual fuel. Install plug and cap onto hose and stow (WP 0008 00). Install dust cap on external fuel port.

7. Stow wheel assemblies as follows:

CAUTION

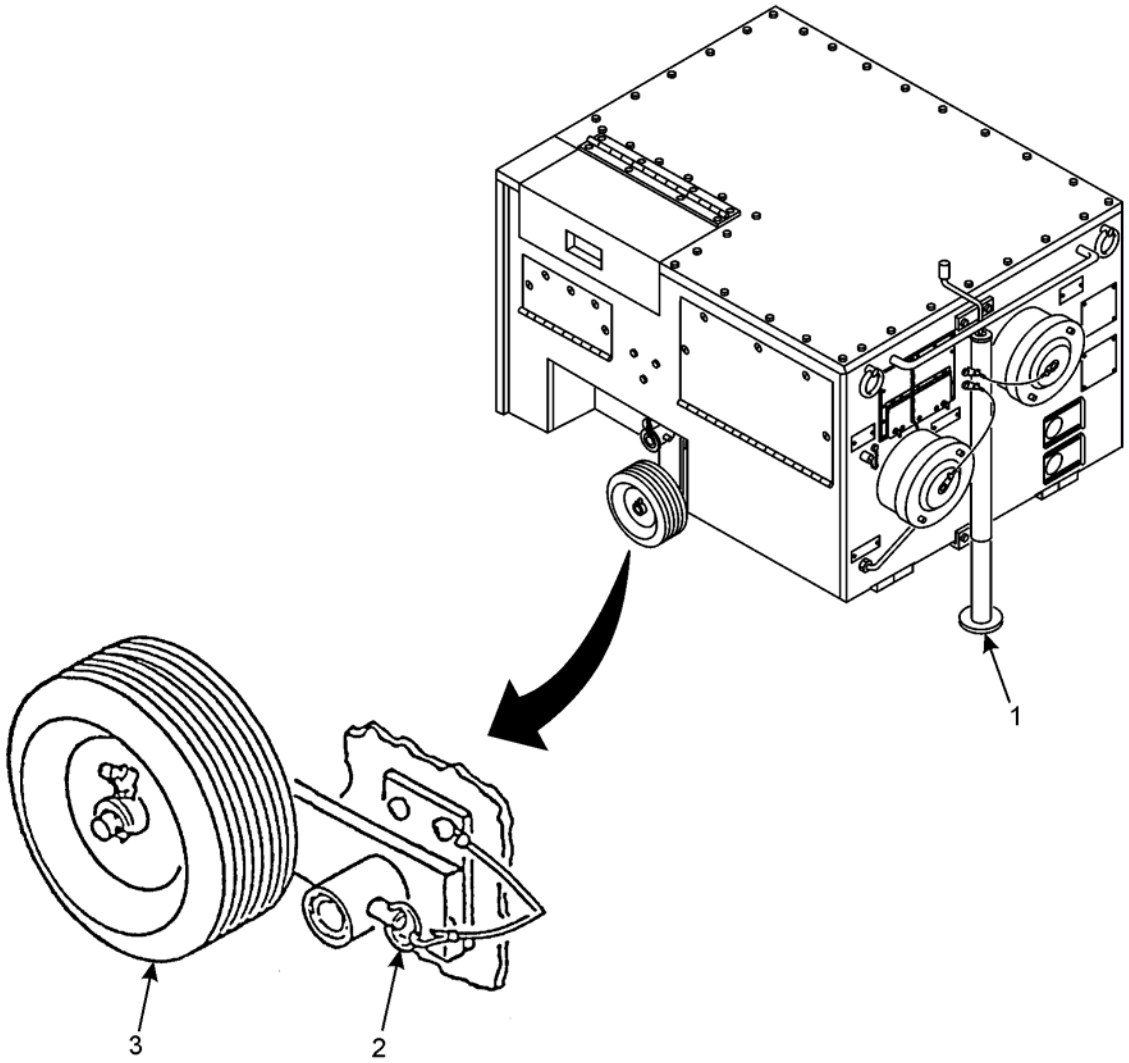
Do not overextend jack or damage to jack may result.

   a. Raise front of ASH by extending attached jack assembly (1).

   b. Remove wheel pin (2) and move wheels (3) up toward rear of ASH and install wheel pin.

   c. Lower front of ASH.

PREPARATION FOR MOVEMENT – Continued



ADMINISTRATIVE STORAGE

Placement of equipment in administrative storage should be for short periods of time when a shortage of maintenance effort exists. Items should be in mission readiness within 24 hours or within the time factors as determined by the directing authority. During the storage period, appropriate maintenance records will be kept. Before placing equipment in administrative storage, current PMCS should be completed, shortcomings and deficiencies should be corrected, and all Modification Work Orders (MWOs) should be applied. Inside storage is preferred for items selected for administrative storage. If inside storage is not available, trucks, vans, conex containers, and other containers may be used.

PACKING INSTRUCTIONS

Equipment may be crated in wooden crate or wrapped in plastic wrap.

Wooden Crate

1. Install supply and return air hose assemblies (7) into shipping containers (1) and seal containers.

WARNING

ASH weighs 360 pounds (163.3 kg). Mechanical lift is required. For localized movement and positioning, lower wheels and manually move ASH to desired location by utilizing handrails.

2. Install ASH (5) onto skid (6).

WARNING

Steel bands under tension can snap free and cause injury to personnel. Leather gloves and face shield are required.

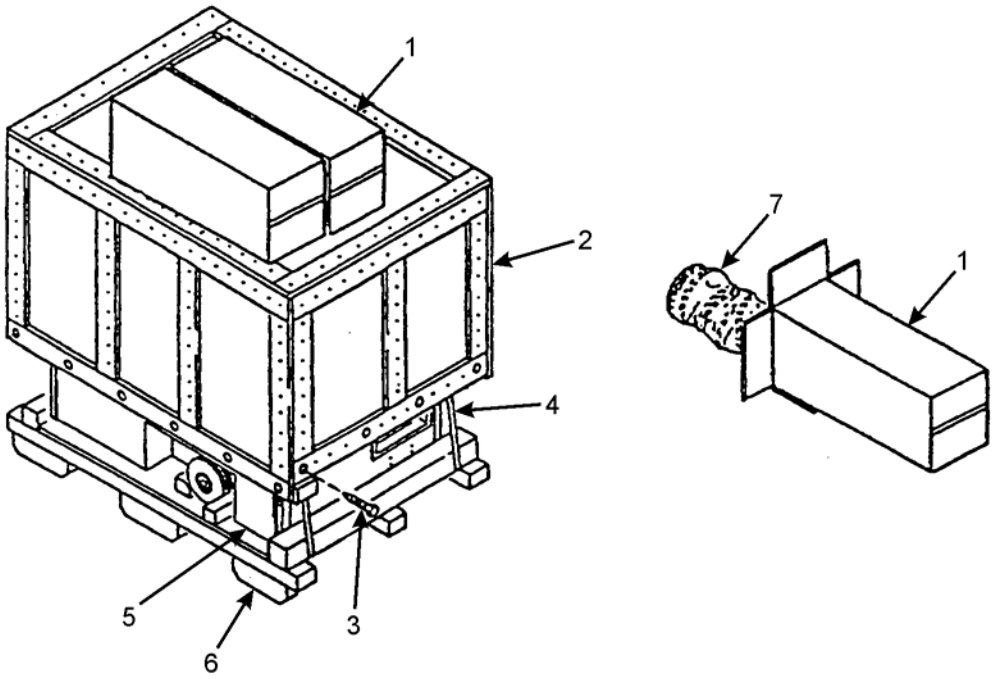
3. Apply steel bands (4) around ASH (3) to secure ASH to skid (6).

WARNING

Wooden packing crate weighs 100 pounds (45.4 kg). Two people are required to lift.

4. Install wooden crate (2) over ASH (5) and install 18 lag bolts (3).

5. Place supply and return air hose assemblies sealed shipping containers (1) on top of wooden crate (2).



PACKING INSTRUCTIONS – Continued

Plastic Wrap

1. Install supply and return air hose assemblies (6) into shipping containers (2) and seal containers.

WARNING

ASH weighs 360 pounds (163.3 kg). Mechanical lift is required. For localized movement and positioning, lower wheels and manually move ASH to desired location by utilizing handrails.

2. Install ASH (3) onto skid (5).

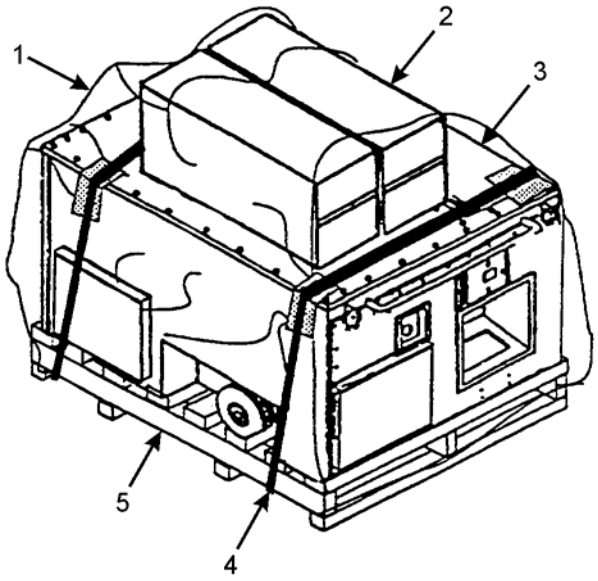
WARNING

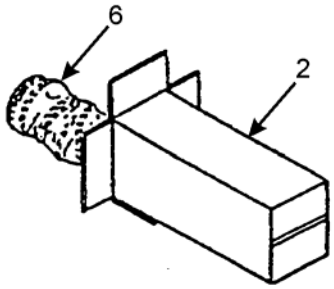
Steel bands under tension can snap free and cause injury to personnel. Leather gloves and face shield are required.

3. Apply steel bands (4) around ASH (3) to secure ASH to skid.

4. Place sealed supply and return assemblies shipping containers (2) on top of ASH (3).

5. Install plastic wrap (1).





END OF WORK PACKAGE

UNIT MAINTENANCE INSTRUCTIONS

ARMY SPACE HEATER H-140

NSN 4520-01-477-0568

ILLUSTRATED LIST OF MANUFACTURED ITEMS

INTRODUCTION

Scope

This work package includes complete instructions for making items authorized to be manufactured or fabricated at the unit maintenance level.

How to Use the Index of Manufactured items

A part number index in alphanumeric order is provided for cross-referencing the part number of the item to be manufactured to the page that covers the fabrication criteria.

Explanation of the Illustrations of Manufactured items

All instructions needed by maintenance personnel to manufacture the item are included on the illustrations. All bulk materials needed for manufacture of an item are listed by part number or specification number in a tabular list of the illustrations.

INDEX OF MANUFACTURED ITEMS

Table 1. Index of Manufactured Items.

ITEM NO.	PART NO.	NAME	PAGE NO.
1	60035-8	Grommet, Control Box Support and Ventilation Air Fan Housing	0047 00-6
2	60104-100	Pin Assembly, Quick-Release	0047 00-6
3	60140-1	Insulation, Cabinet Assembly	0047 00-7
4	60140-2	Insulation, Cabinet Assembly	0047 00-7
5	60140-3	Insulation, Cabinet Assembly	0047 00-7
6	60140-4	Insulation, Cabinet Assembly	0047 00-7
7	60140-6	Insulation, Cabinet Assembly	0047 00-7
8	60140-7	Insulation, Cabinet Assembly	0047 00-7
9	60140-8	Insulation, Cabinet Assembly	0047 00-7
10	60140-9	Insulation, Cabinet Assembly	0047 00-7
11	60140-10	Insulation, Cabinet Assembly	0047 00-7
12	60140-11	Insulation, Cabinet Assembly	0047 00-7
13	60140-12	Insulation, Cabinet Assembly	0047 00-7
14	60140-13	Insulation, Cabinet Assembly	0047 00-7
15	60140-15	Insulation, Cabinet Assembly	0047 00-7
16	60140-17	Insulation, Cabinet Assembly	0047 00-7
17	60140-18	Insulation, Cabinet Assembly	0047 00-7
18	60140-19	Insulation, Cabinet Assembly	0047 00-7
19	60140-20	Insulation, Cabinet Assembly	0047 00-7
20	60140-21	Insulation, Cabinet Assembly	0047 00-7
21	60140-22	Insulation, Cabinet Assembly	0047 00-7
22	60140-23	Insulation, Cabinet Assembly	0047 00-7
23	60140-24	Insulation, Cabinet Assembly	0047 00-7
24	60140-25	Insulation, Cabinet Assembly	0047 00-7

INDEX OF MANUFACTURED ITEMS – Continued

Table 1. Index of Manufactured Items – **Continued.**

ITEM NO.	PART NO.	NAME	PAGE NO.
25	60140-26	Insulation, Cabinet Assembly	0047 00-7
26	60170-1	Insulation, Cabinet Assembly	0047 00-8
27	60171-2	Insulation, Cabinet Assembly	0047 00-9
28	60174-1	Insulation, Door Assembly, Front Side	0047 00-10
29	60175-1	Insulation, Door Assembly, Rear Side	0047 00-11
30	60179-1	Insulation, Rear Panel Assembly	0047 00-12
31	60181-1	Insulation, Cabinet Assembly	0047 00-13
32	60182-1	Insulation, Cabinet Assembly	0047 00-14
33	60182-2	Insulation, Cabinet Assembly	0047 00-14
34	60183-1	Insulation, Cabinet Assembly	0047 00-15
35	60184-1	Insulation, Cabinet Assembly	0047 00-16
36	60185-1	Insulation, Cabinet Assembly	0047 00-17
37	60186-1	Insulation, Cabinet Assembly	0047 00-18
38	60187-1	Insulation, Cabinet Assembly	0047 00-19
39	60188-3	Insulation, Top Panel Assembly	0047 00-20
40	60188-4	Insulation, Top Panel Assembly	0047 00-21
41	60188-5	Insulation, Top Panel Assembly	0047 00-22
42	60190-1	Insulation, Cabinet Assembly	0047 00-23
43	60220-3	Gasket, Exhaust Door	0047 00-24
44	60220-4	Gasket, Exhaust Door	0047 00-24
45	60258-2	Gasket, Top Panel Assembly	0047 00-25
46	60258-3	Gasket, Top Panel Assembly	0047-00-25
47	60258-4	Gasket, Top Panel Assembly	0047 00-25
48	60258-5	Gasket, Top Panel Assembly	0047 00-25

INDEX OF MANUFACTURED ITEMS – Continued

Table 1. Index of Manufactured Items – **Continued.**

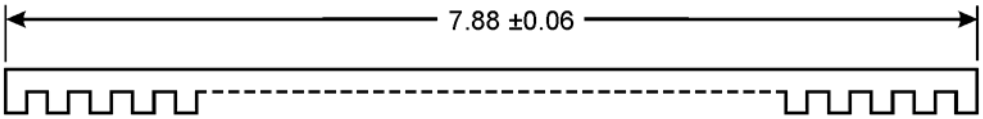
ITEM NO.	PART NO.	NAME	PAGE NO.
49	60258-6	Gasket, Top Panel Assembly	0047 00-25
50	60258-7	Gasket, Top Panel Assembly	0047 00-25
51	60260-43	Gasket, Motor Contactor	0047 00-26
52	60320-34	Gasket, Cabinet Assembly	0047 00-27
53	60320-35	Gasket, Cabinet Assembly	0047 00-27
54	60320-36	Gasket, Cabinet Assembly	0047 00-27
55	60320-37	Gasket, Cabinet Assembly	0047 00-27
56	60320-38	Gasket, Cabinet Assembly	0047 00-27
57	60320-39	Gasket, Cabinet Assembly	0047 00-27
58	60320-40	Gasket, Cabinet Assembly	0047 00-27
59	60320-41	Gasket, Cabinet Assembly	0047 00-27
60	60320-42	Gasket, Cabinet Assembly	0047 00-27
61	60327-1	Chain, Damper Assembly	0047 00-27
62	60328-1	Gasket, Damper Cover Plate	0047 00-28
63	60329-1	Gasket, Damper Door	0047 00-29
64	60347-1	Hinge	0047 00-29
65	60370-11	Gasket, Top Rear Panel Assembly	0047 00-30
66	60370-12	Gasket, Top Rear Panel Assembly	0047 00-30
67	60370-13	Gasket, Rear Panel Assembly	0047 00-31
68	60414-101	Detector Assembly, Flame	0047 00-32
69	60440-101	Wire Harness, Thermostats	0047 00-33
70	60558-2	Cable, Exhaust Port Cover	0047 00-34
71	60565-4	Cable, Duct Cover Assembly	0047 00-34
72	60588-1	Gasket, Combustion Air Outlet	0047 00-35

INDEX OF MANUFACTURED ITEMS – Continued

Table 1. Index of Manufactured Items – **Continued.**

ITEM NO.	PART NO.	NAME	PAGE NO.
73	60617-1	Hinge	0047 00-36
74	60625-1	Hinge	0047 00-37
75	60755-100	Tube Assembly, Fuel Pump	0047 00-38
76	60756-100	Tube Assembly, Fuel Pump	0047 00-39
77	60757-100	Tube Assembly, Fuel Tank/Rear Panel	0047 00-40
78	60758-100	Tube Assembly, Rear Panel/Fuel Filter	0047 00-41
79	60759-100	Tube Assembly, Solenoid/Fuel Tank	0047 00-42
80	60761-100	Tube Assembly, Gage	0047 00-43
81	60762-100	Tube Assembly, Rear Panel	0047 00-44
82	60766-1	Gasket, Remote Control Box	0047 00-45
83	60770-5	Chain, Remote Control Box	0047 00-46
84	60780-14	Gasket, Control Box	0047 00-46
85	60780-15	Gasket, Control Box	0047 00-46
86	60781-3	Gasket, Control Box Lid	0047 00-47
87	60781-4	Gasket, Control Box Lid	0047 00-47
88	60840-5	Gasket, Transformer Assembly	0047 00-48
89	60840-16	Shield, Braided, Transformer	0047 00-48
90	60841-2	Gasket, Capacitor Bracket	0047 00-49
91	60843-4	Gasket, Transformer Lid	0047 00-49
92	60843-7	Gasket, EMI	0047 00-50
93	60873-1	Insulation	0047 00-51
94	60873-2	Insulation	0047 00-51
95	60881-1	Insulation, Rear Panel Assembly	0047 00-52
96	13229E8567	Adapter, Power Cable	0047 00-53

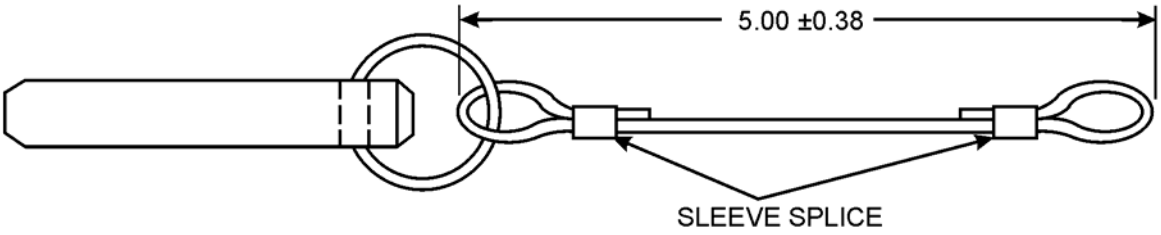
ILLUSTRATIONS OF MANUFACTURED ITEMS



NOTE:

MAKE FROM GROMMET, NONMETALLIC, P/N MS 21266-2N, NSN 5325-00-074-3301 (96906).

Grommet, Control Box Support and Ventilation Air Fan Housing P/N 60035-8



NOTES:

MAKE FROM:

WIRE ROPE, P/N 8930T33, NSN 4010-00-575-6233 (39428)
SLEEVE, SPLICING, P/N 3623T14 (39428), 2 REQUIRED
QUICK-RELEASE PIN, P/N 98320A501 (39428)

Pin Assembly, Quick-Release P/N 60104-100

ILLUSTRATIONS OF MANUFACTURED ITEMS – Continued

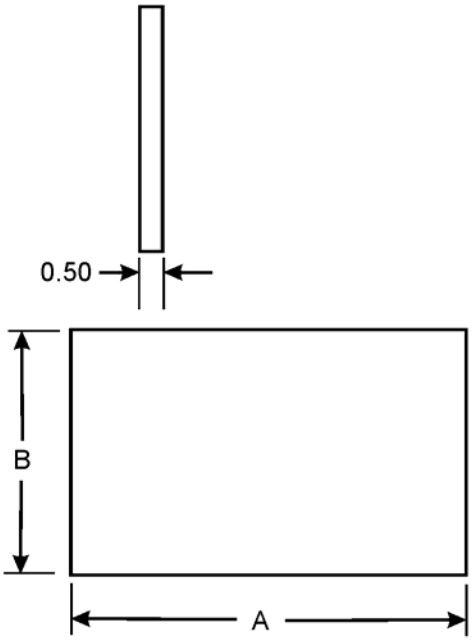


TABLE 1 ITEM NO.	PART NO.	A (INCHES)	B (INCHES)
3	60140-1	8.68	5.38
4	60140-2	21.38	5.88
5	60140-3	10.38	5.38
6	60140-4	10.88	5.38
7	60140-6	20.25	7.38
8	60140-7	28.25	10.88
9	60140-8	7.88	7.38
10	60140-9	13.50	5.38
11	60140-10	7.50	5.38
12	60140-11	9.00	8.12
13	60140-12	11.62	7.88
14	60140-13	7.88	5.38
15	60140-15	13.00	4.00
16	60140-17	24.75	1.75
17	60140-18	15.38	1.75
18	60140-19	13.00	8.12
19	60140-20	21.38	4.00
20	60140-21	13.50	8.75
21	60140-22	10.25	3.12
22	60140-23	22.12	4.00
23	60140-24	4.50	27.25
24	60140-25	11.00	11.00
25	60140-26	50.00	20.00

NOTES:

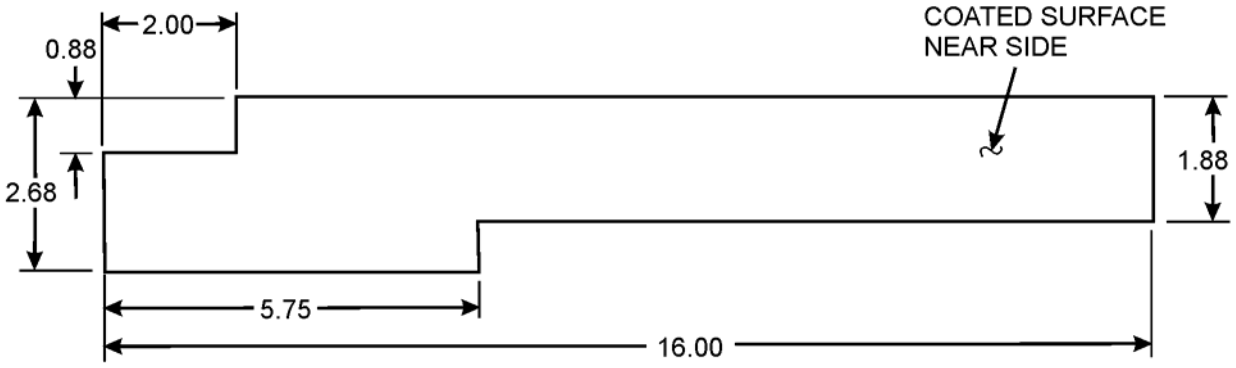
MAKE FROM RUBBER INSULATION, 0.50 INCH THICK, ENSOLITE TYPE MLC, BLACK (OW711).

IF NOT DIE CUT, TOLERANCES ARE AS FOLLOWS:

DIMENSIONS LESS THAN 2.00 INCHES = ±0.12
DIMENSIONS 2.00 TO 4.00 INCHES = ±0.19
DIMENSIONS GREATER THAN 4.00 INCHES = ±0.25

Insulation, Cabinet Assembly P/N 60140-1 thru -4, -6 thru -13, -15, and -17 thru -26

ILLUSTRATIONS OF MANUFACTURED ITEMS – Continued



NOTES:

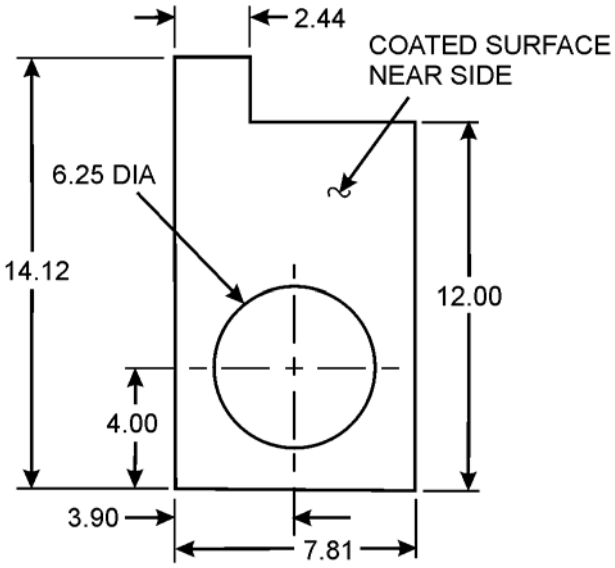
MAKE FROM RUBBER INSULATION SHEET, 0.50 INCH THICK, ENSOLITE TYPE MLC, BLACK (OW711).

IF NOT DIE CUT, TOLERANCES ARE AS FOLLOWS:

DIMENSIONS LESS THAN 2.00 INCHES = ±0.12
DIMENSIONS 2.00 TO 4.00 INCHES = ±0.19
DIMENSIONS GREATER THAN 4.00 INCHES = ±0.25

Insulation, Cabinet Assembly P/N 60170-1

ILLUSTRATIONS OF MANUFACTURED ITEMS – Continued



NOTES:

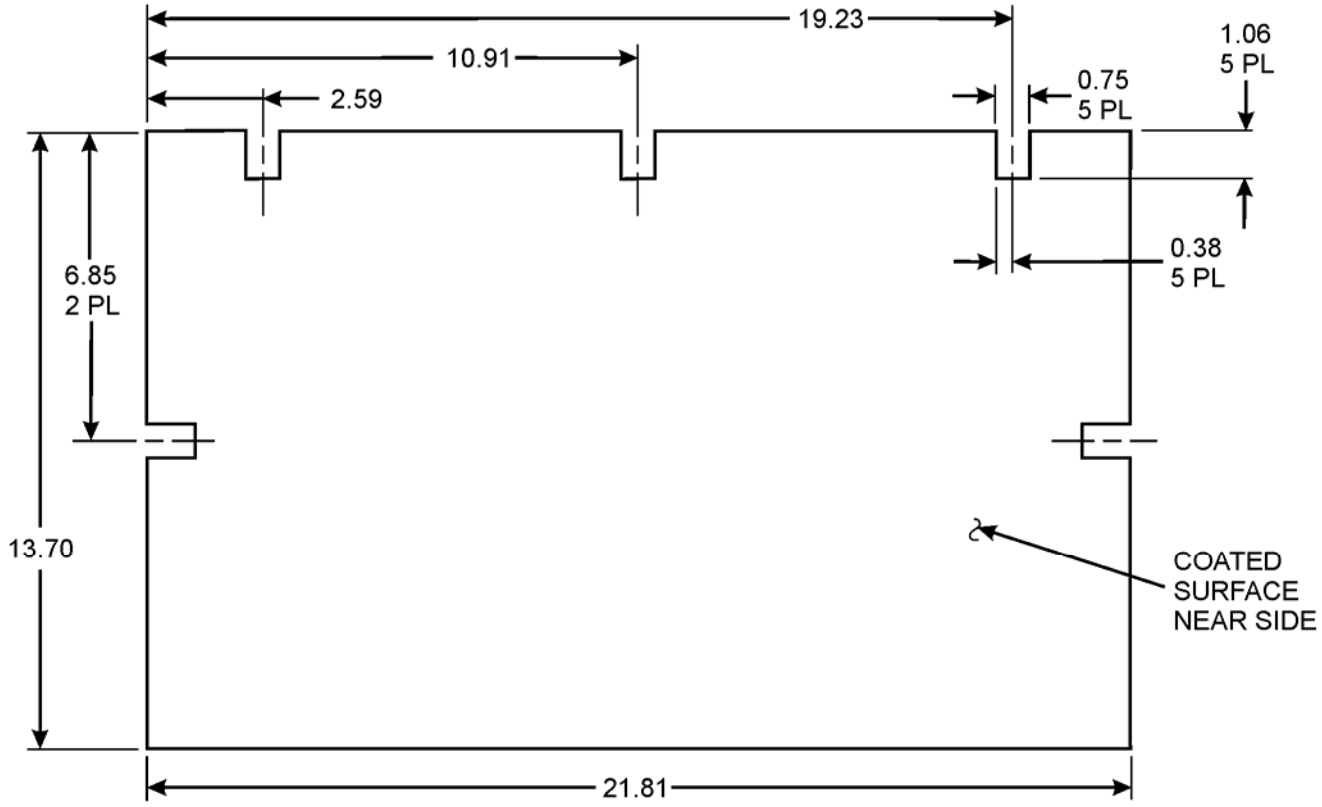
MAKE FROM RUBBER INSULATION SHEET, 0.50 INCH THICK, ENSOLITE TYPE MLC, BLACK (OW711).

IF NOT DIE CUT, TOLERANCES ARE AS FOLLOWS:

DIMENSIONS LESS THAN 2.00 INCHES = ±0.12
DIMENSIONS 2.00 TO 4.00 INCHES = ±0.19
DIMENSIONS GREATER THAN 4.00 INCHES = ±0.25

Insulation, Cabinet Assembly P/N 60171-2

ILLUSTRATIONS OF MANUFACTURED ITEMS – Continued



NOTES:

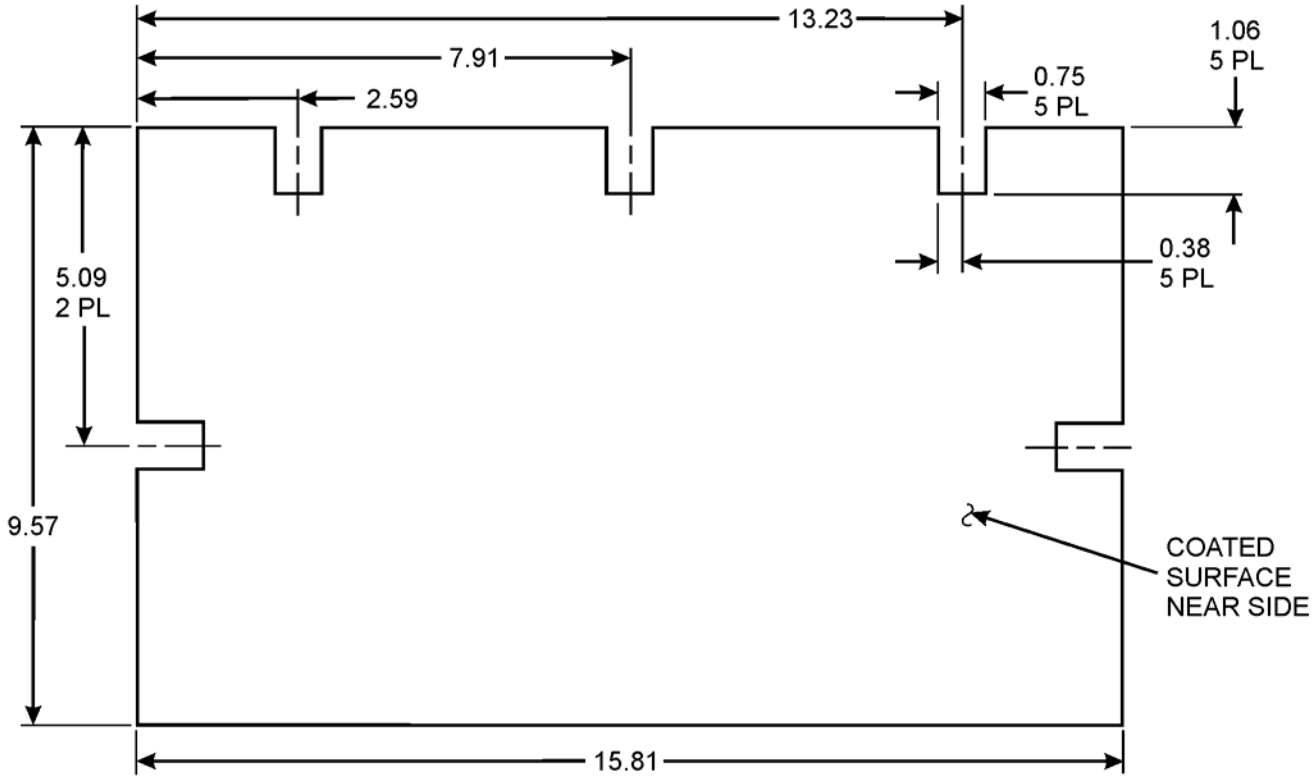
MAKE FROM RUBBER INSULATION SHEET, 0.50 INCH THICK, ENSOLITE TYPE MLC, BLACK (OW711).

IF NOT DIE CUT, TOLERANCES ARE AS FOLLOWS:

DIMENSIONS LESS THAN 2.00 INCHES = ±0.12
DIMENSIONS 2.00 TO 4.00 INCHES = ±0.19
DIMENSIONS GREATER THAN 4.00 INCHES = ±0.25

Insulation, Door Assembly, Front Side P/N 60174-1

ILLUSTRATIONS OF MANUFACTURED ITEMS – Continued



NOTES:

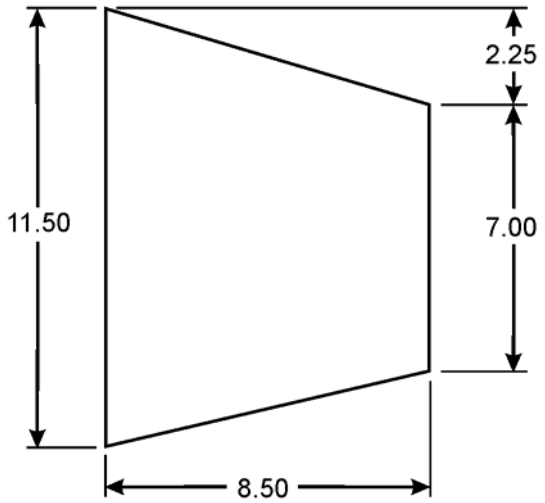
MAKE FROM RUBBER INSULATION SHEET, 0.50 INCH THICK, ENSOLITE TYPE MLC, BLACK (OW711).

IF NOT DIE CUT, TOLERANCES ARE AS FOLLOWS:

DIMENSIONS LESS THAN 2.00 INCHES = ±0.12
DIMENSIONS 2.00 TO 4.00 INCHES = ±0.19
DIMENSIONS GREATER THAN 4.00 INCHES = ±0.25

Insulation, Door Assembly, Rear Side P/N 60175-1

ILLUSTRATIONS OF MANUFACTURED ITEMS – Continued



NOTES:

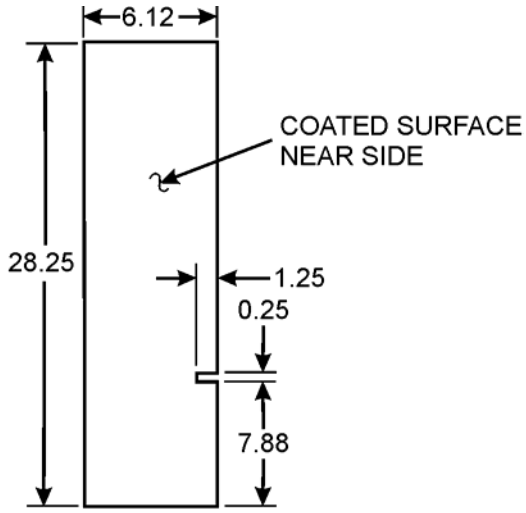
MAKE FROM RUBBER INSULATION SHEET, 0.50 INCH THICK, ENSOLITE TYPE MLC, BLACK (OW711).

IF NOT DIE CUT, TOLERANCES ARE AS FOLLOWS:

DIMENSIONS LESS THAN 2.00 INCHES = ±0.12
DIMENSIONS 2.00 TO 4.00 INCHES = ±0.19
DIMENSIONS GREATER THAN 4.00 INCHES = ±0.25

Insulation, Rear Panel Assembly P/N 60179-1

ILLUSTRATIONS OF MANUFACTURED ITEMS – Continued



NOTES:

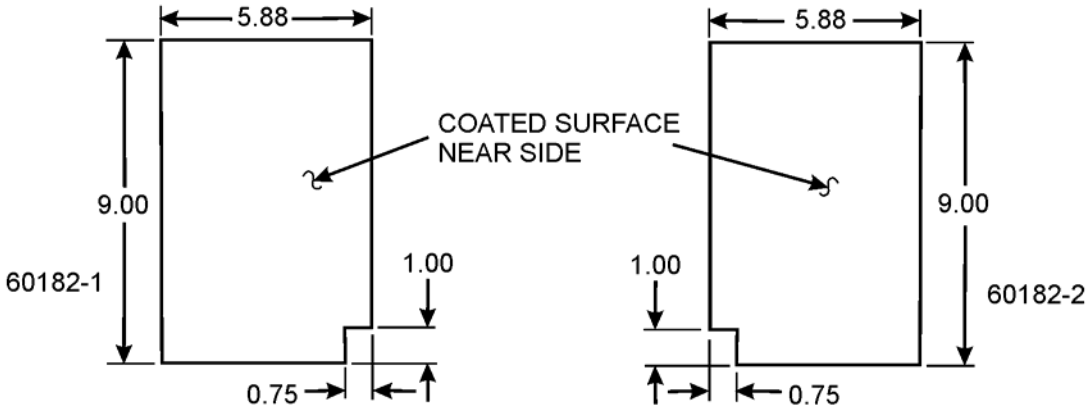
MAKE FROM RUBBER INSULATION SHEET, 0.50 INCH THICK, ENSOLITE TYPE MLC, BLACK (OW711).

IF NOT DIE CUT, TOLERANCES ARE AS FOLLOWS:

DIMENSIONS LESS THAN 2.00 INCHES = ±0.12
DIMENSIONS 2.00 TO 4.00 INCHES = ±0.19
DIMENSIONS GREATER THAN 4.00 INCHES = ±0.25

Insulation, Cabinet Assembly P/N 60181-1

ILLUSTRATIONS OF MANUFACTURED ITEMS – Continued



NOTES:

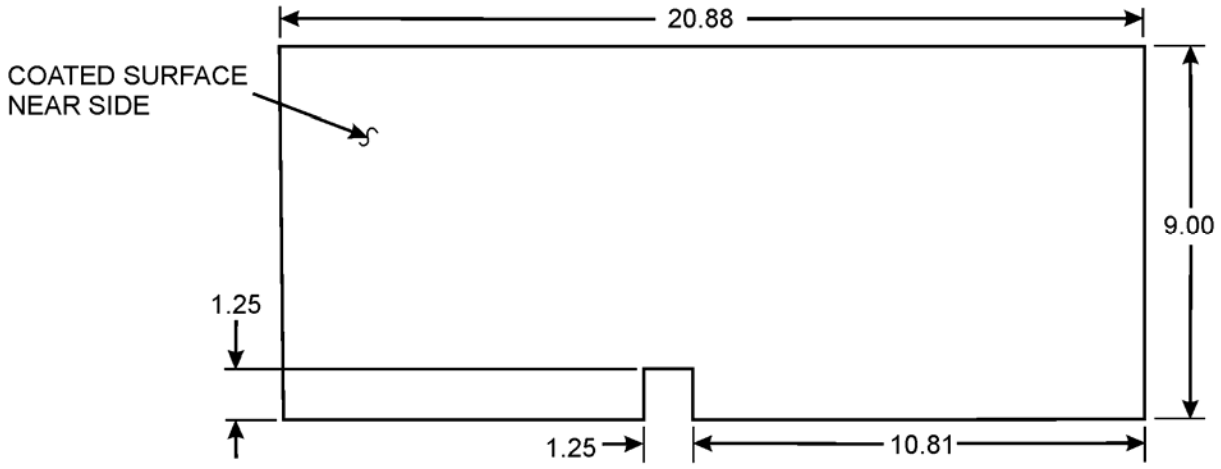
MAKE FROM RUBBER INSULATION SHEET, 0.50 INCH THICK, ENSOLITE TYPE MLC, BLACK (OW711).

IF NOT DIE CUT, TOLERANCES ARE AS FOLLOWS:

DIMENSIONS LESS THAN 2.00 INCHES = ±0.12
DIMENSIONS 2.00 TO 4.00 INCHES = ±0.19
DIMENSIONS GREATER THAN 4.00 INCHES = ±0.25

Insulation, Cabinet Assembly P/N 60182-1 and -2

ILLUSTRATIONS OF MANUFACTURED ITEMS – Continued



NOTES:

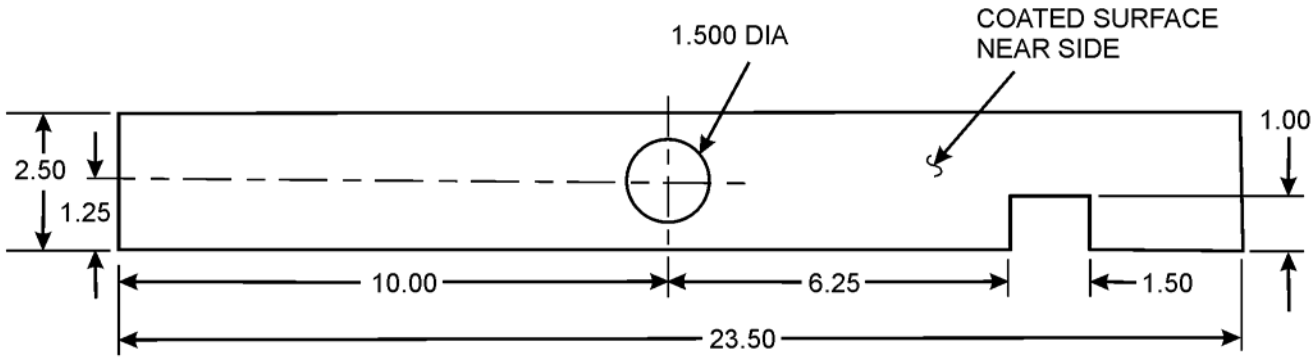
MAKE FROM RUBBER INSULATION SHEET, 0.50 INCH THICK, ENSOLITE TYPE MLC, BLACK (OW711).

IF NOT DIE CUT, TOLERANCES ARE AS FOLLOWS:

DIMENSIONS LESS THAN 2.00 INCHES = ±0.12
DIMENSIONS 2.00 TO 4.00 INCHES = ±0.19
DIMENSIONS GREATER THAN 4.00 INCHES = ±0.25

Insulation, Cabinet Assembly P/N 60183-1

ILLUSTRATIONS OF MANUFACTURED ITEMS – Continued



NOTES:

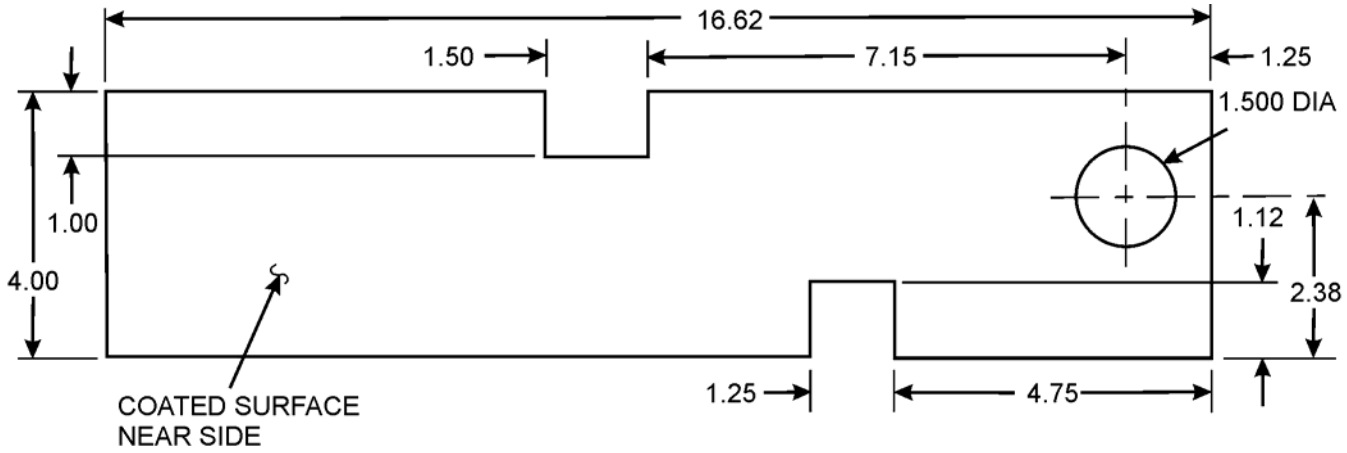
MAKE FROM RUBBER INSULATION SHEET, 0.50 INCH THICK, ENSOLITE TYPE MLC, BLACK (OW711).

IF NOT DIE CUT, TOLERANCES ARE AS FOLLOWS:

DIMENSIONS LESS THAN 2.00 INCHES = ±0.12
DIMENSIONS 2.00 TO 4.00 INCHES = ±0.19
DIMENSIONS GREATER THAN 4.00 INCHES = ±0.25

Insulation, Cabinet Assembly P/N 60184-1

ILLUSTRATIONS OF MANUFACTURED ITEMS – Continued



NOTES:

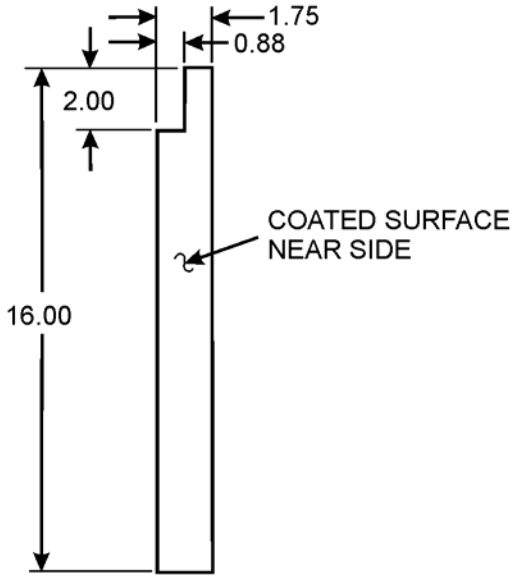
MAKE FROM RUBBER INSULATION SHEET, 0.50 INCH THICK, ENSOLITE TYPE MLC, BLACK (OW711).

IF NOT DIE CUT, TOLERANCES ARE AS FOLLOWS:

DIMENSIONS LESS THAN 2.00 INCHES = ±0.12
DIMENSIONS 2.00 TO 4.00 INCHES = ±0.19
DIMENSIONS GREATER THAN 4.00 INCHES = ±0.25

Insulation, Cabinet Assembly P/N 60185-1

ILLUSTRATIONS OF MANUFACTURED ITEMS – Continued



NOTES:

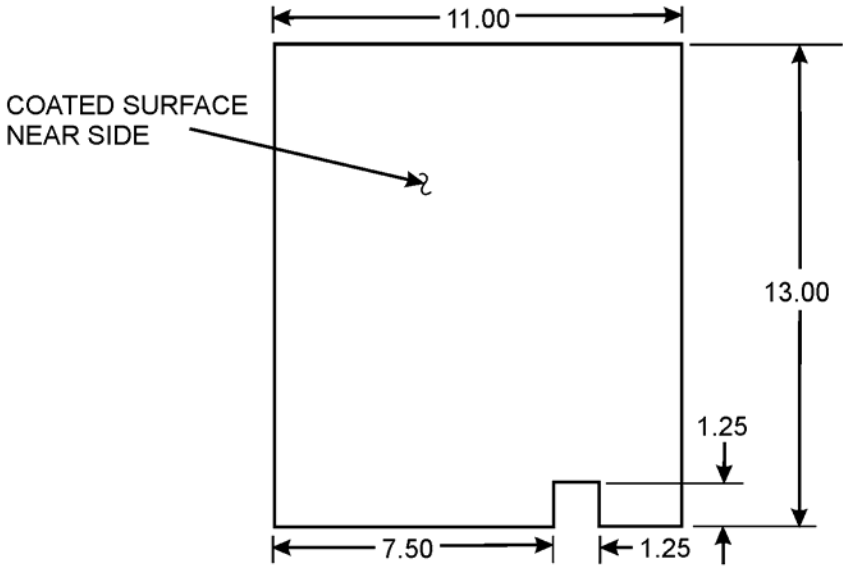
MAKE FROM RUBBER INSULATION SHEET, 0.50 INCH THICK, ENSOLITE TYPE MLC, BLACK (0W711).

IF NOT DIE CUT, TOLERANCES ARE AS FOLLOWS:

DIMENSIONS LESS THAN 2.00 INCHES = ±0.12
DIMENSIONS 2.00 TO 4.00 INCHES = ±0.19
DIMENSIONS GREATER THAN 4.00 INCHES = ±0.25

Insulation, Cabinet Assembly P/N 60186-1

ILLUSTRATIONS OF MANUFACTURED ITEMS – Continued



NOTES:

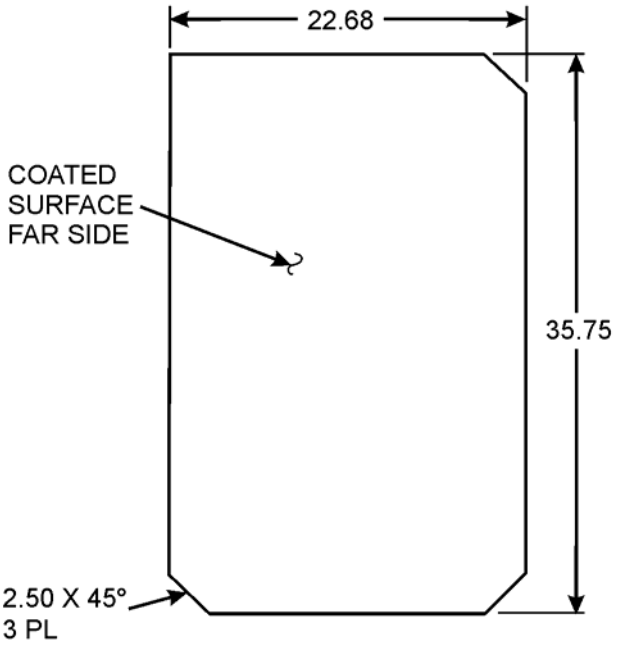
MAKE FROM RUBBER INSULATION SHEET, 0.50 INCH THICK ENSOLITE TYPE MLC, BLACK (OW711).

IF NOT DIE CUT, TOLERANCES ARE AS FOLLOWS:

DIMENSIONS LESS THAN 2.00 INCHES = ±0.12
DIMENSIONS 2.00 TO 4.00 INCHES = ±0.19
DIMENSIONS GREATER THAN 4.00 INCHES = ±0.25

Insulation, Cabinet Assembly P/N 60187-1

ILLUSTRATIONS OF MANUFACTURED ITEMS – Continued



NOTES:

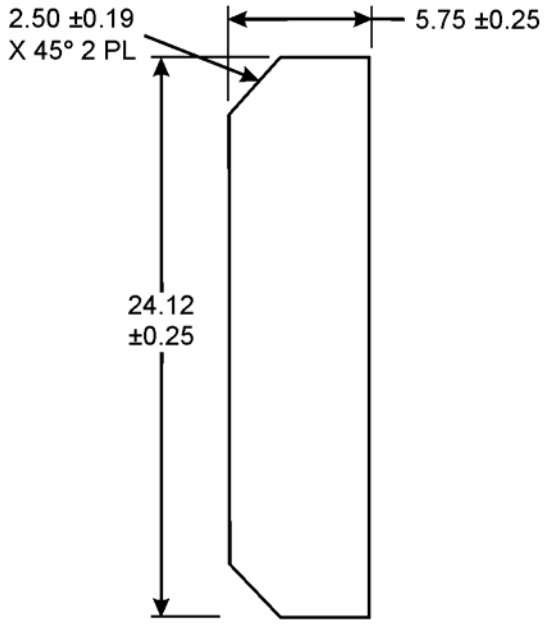
MAKE FROM RUBBER INSULATION SHEET, 0.50 INCH THICK, ENSOLITE TYPE MLC, BLACK (OW711).

IF NOT DIE CUT, TOLERANCES ARE AS FOLLOWS:

DIMENSIONS LESS THAN 2.00 INCHES = ±0.12
DIMENSIONS 2.00 TO 4.00 INCHES = ±0.19
DIMENSIONS GREATER THAN 4.00 INCHES = ±0.25

Insulation, Top Panel Assembly P/N 60188-3

ILLUSTRATIONS OF MANUFACTURED ITEMS – Continued



NOTES:

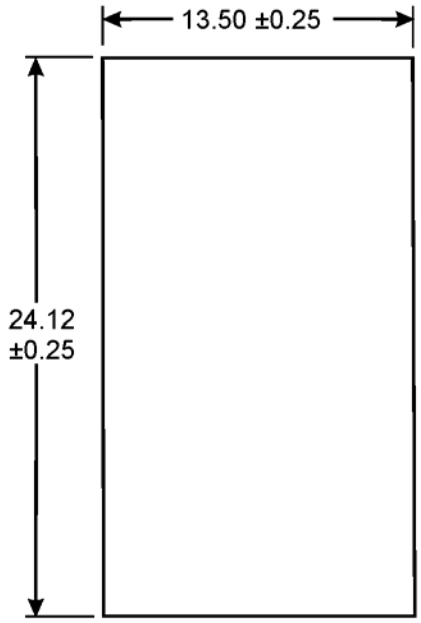
MAKE FROM RUBBER INSULATION SHEET, 0.50 INCH THICK, ENSOLITE TYPE MLC, BLACK (OW711).

IF NOT DIE CUT, TOLERANCES ARE AS FOLLOWS:

DIMENSIONS LESS THAN 2.00 INCHES = ±0.12
DIMENSIONS 2.00 TO 4.00 INCHES = ±0.19
DIMENSIONS GREATER THAN 4.00 INCHES = ±0.25

Insulation, Top Panel Assembly P/N 60188-4

ILLUSTRATIONS OF MANUFACTURED ITEMS – Continued



NOTES:

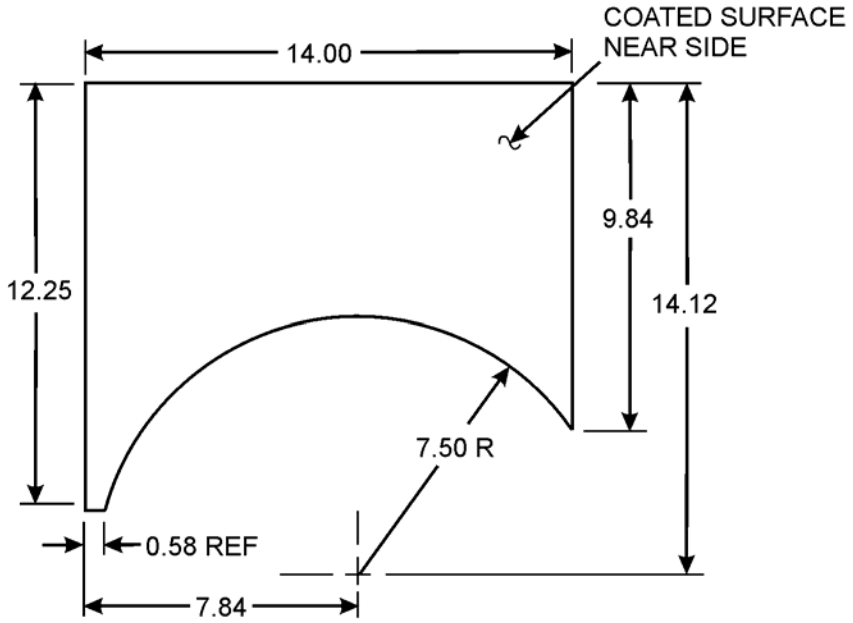
MAKE FROM RUBBER INSULATION SHEET, 0.50 INCH THICK, ENSOLITE TYPE MLC, BLACK (OW711).

IF NOT DIE CUT, TOLERANCES ARE AS FOLLOWS:

DIMENSIONS LESS THAN 2.00 INCHES = ±0.12
DIMENSIONS 2.00 TO 4.00 INCHES = ±0.19
DIMENSIONS GREATER THAN 4.00 INCHES = ±0.25

Insulation, Top Panel Assembly P/N 60188-5

ILLUSTRATIONS OF MANUFACTURED ITEMS – Continued



NOTES:

MAKE FROM RUBBER INSULATION SHEET, 0.50 INCH THICK, ENSOLITE TYPE MLC, BLACK (OW711).

IF NOT DIE CUT, TOLERANCES ARE AS FOLLOWS:

DIMENSIONS LESS THAN 2.00 INCHES = ±0.12
DIMENSIONS 2.00 TO 4.00 INCHES = ±0.19
DIMENSIONS GREATER THAN 4.00 INCHES = ±0.25

Insulation, Cabinet Assembly P/N 60190-1

ILLUSTRATIONS OF MANUFACTURED ITEMS – Continued

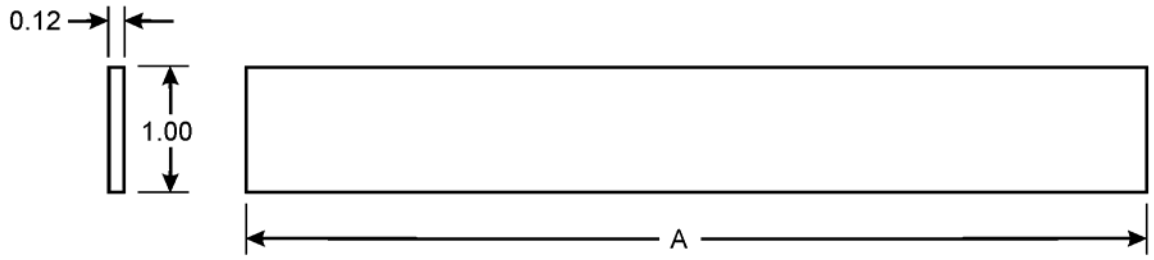


TABLE 1 ITEM NO.	PART NO.	A (INCHES)	QUANTITY
44	60220-3	4.84	2
45	60220-4	8.42	2

NOTE:

MAKE FROM RUBBER, NEOPRENE, SPONGE, ADHESIVE BACK, 0.12 INCH THICK, P/N R411NPSA (86730).

Gasket, Exhaust Door P/N 60220-3 and -4

ILLUSTRATIONS OF MANUFACTURED ITEMS – Continued

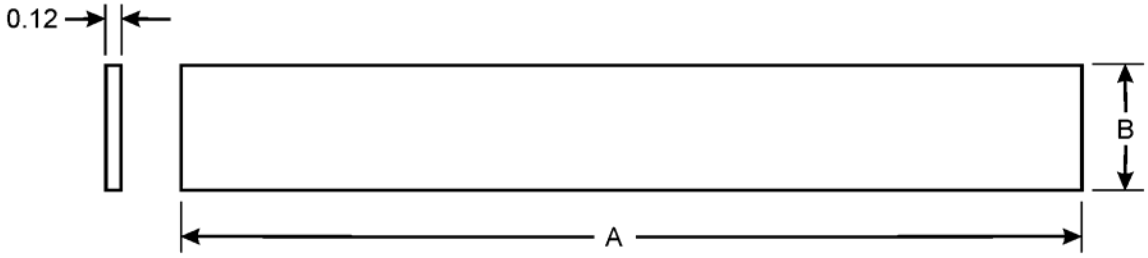


TABLE 1 ITEM NO.	PART NO.	A (INCHES)	B (INCHES)
46	60258-2	39.50	1.50
47	60258-3	24.00	1.50
48	60258-4	13.00	1.50
49	60258-5	22.00	1.50
50	60258-6	28.00	1.50
51	60258-7	47.50	1.50

NOTES:

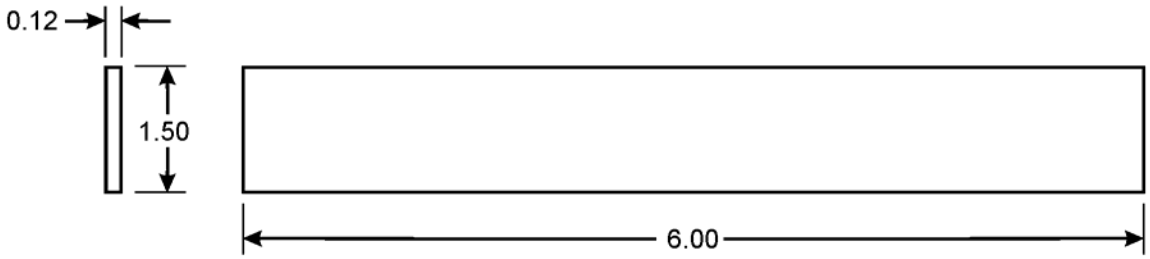
MAKE FROM RUBBER, NEOPRENE, SPONGE, ADHESIVE BACK, 0.12 INCH THICK, P/N 411N (86730).

DIMENSIONAL TOLERANCES:

±0.18 AT INITIAL INSTALLATION
±0.36 AFTER INSTALLATION FOR SHRINKAGE, GROWTH, OR SLIPPAGE

Gasket, Top Panel Assembly P/N 60258-2 thru -7

ILLUSTRATIONS OF MANUFACTURED ITEMS – Continued



NOTES:

MAKE FROM RUBBER, NEOPRENE, SPONGE, ADHESIVE BACK, 0.12 INCH THICK, P/N R411NPSA (86730).

TOLERANCES: WIDTH ±0.25; LENGTH ±0.50

Gasket, Motor Contactor P/N 60260-43

ILLUSTRATIONS OF MANUFACTURED ITEMS – Continued

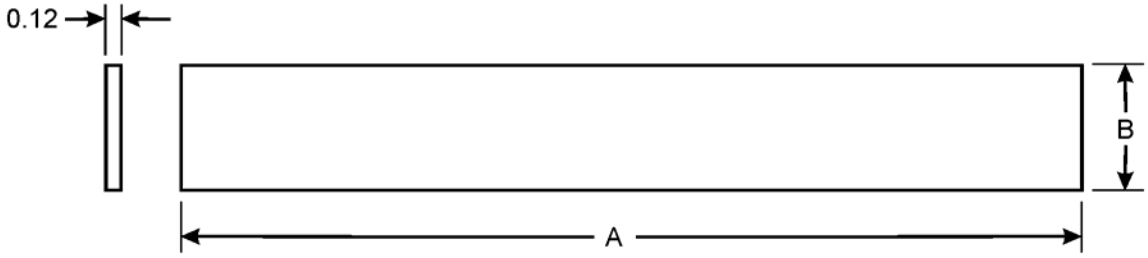
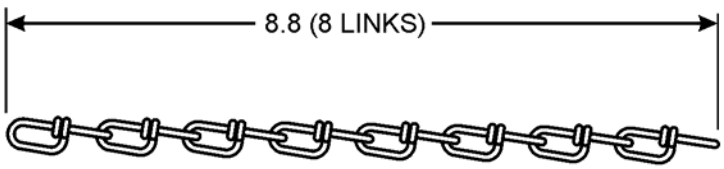


TABLE 1 ITEM NO.	PART NO.	A (INCHES)	B (INCHES)	QUANTITY
53	60320-34	17.25	1.00	1
54	60320-35	9.00	1.00	2
55	60320-36	17.25	1.00	1
56	60320-37	16.12	1.50	1
57	60320-38	7.25	1.00	2
58	60320-39	16.12	1.00	1
59	60320-40	22.12	1.00	1
60	60320-41	11.38	1.50	2
61	60320-42	22.12	1.50	1

NOTE:

MAKE FROM RUBBER, NEOPRENE, SPONGE, ADHESIVE BACK, 0.12 INCH THICK, P/N 411NPSA (86730).

Gasket, Cabinet Assembly P/N 60320-34 thru -42

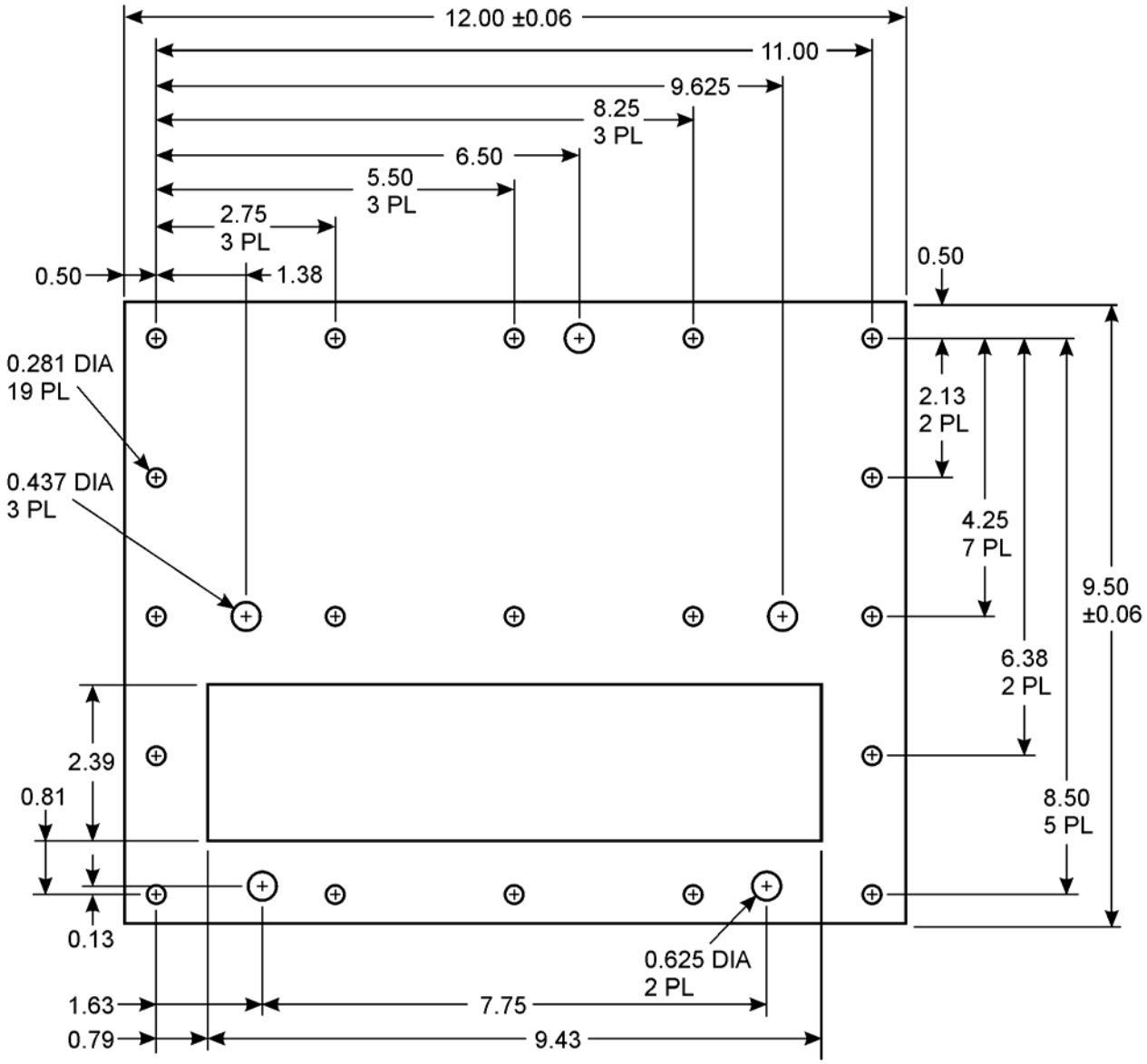


NOTE:

MAKE FROM DOUBLE LOOP COIL CHAIN, RR-C-271, TYPE II, CLASS 2, TRADE SIZE 3, ZINC PLATED, NSN 4010-00-129-3221 (81348), OR COMMERCIAL EQUIVALENT.

Chain, Damper Assembly P/N 60327-1

ILLUSTRATIONS OF MANUFACTURED ITEMS – Continued

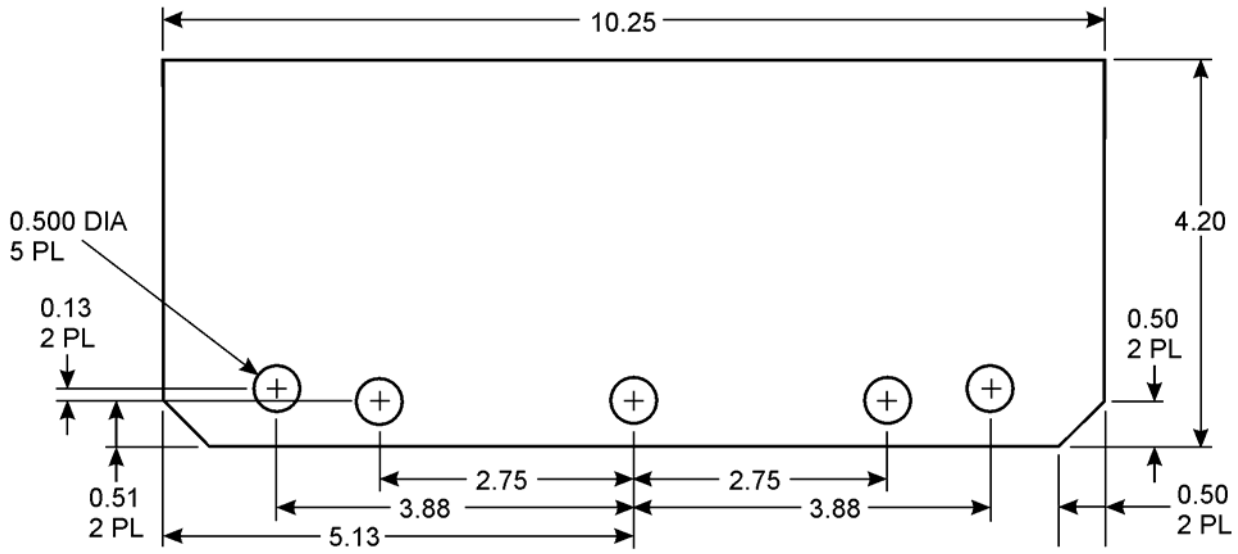


NOTE:

MAKE FROM RUBBER, NEOPRENE, SPONGE, ADHESIVE BACK, 0.12 INCH THICK, P/N 411NPSA (86730).

Gasket, Damper Cover Plate P/N 60328-1

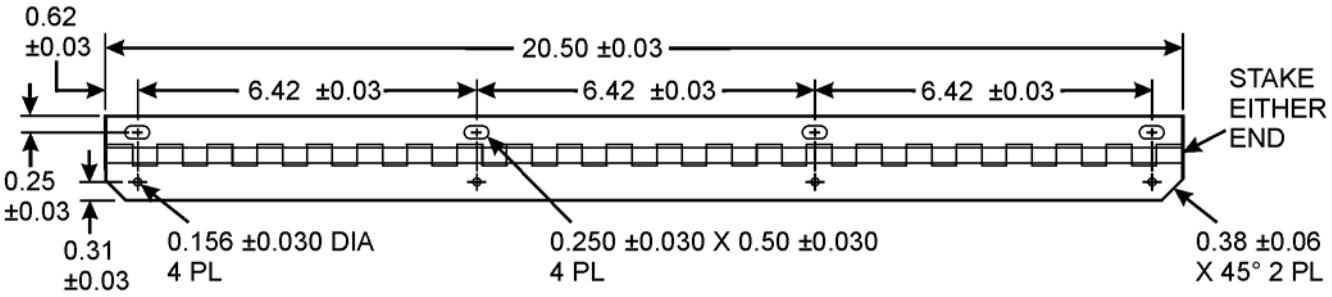
ILLUSTRATIONS OF MANUFACTURED ITEMS – Continued



NOTE:

MAKE FROM RUBBER, NEOPRENE, SPONGE, ADHESIVE BACK, 0.19 INCH THICK, P/N 411NPSA (86730).

Gasket, Damper Door P/N 60329-1



NOTE:

MAKE FROM HINGE, 1.50 INCH WIDE, 0.062 INCH THICK, P/N MS20257C4-4800 (96906).

Hinge P/N 60347-1

ILLUSTRATIONS OF MANUFACTURED ITEMS – Continued

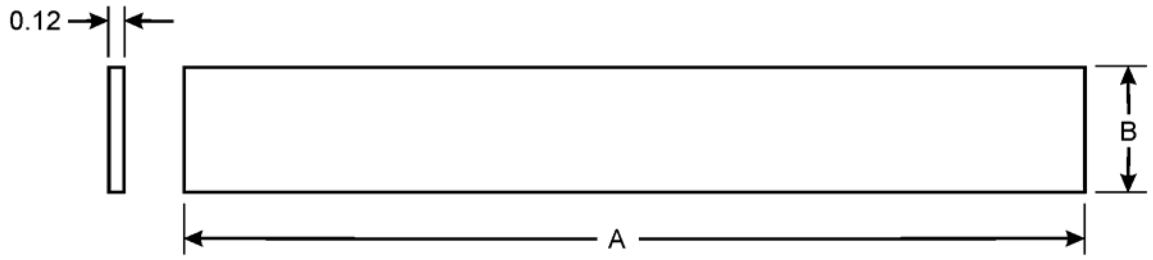


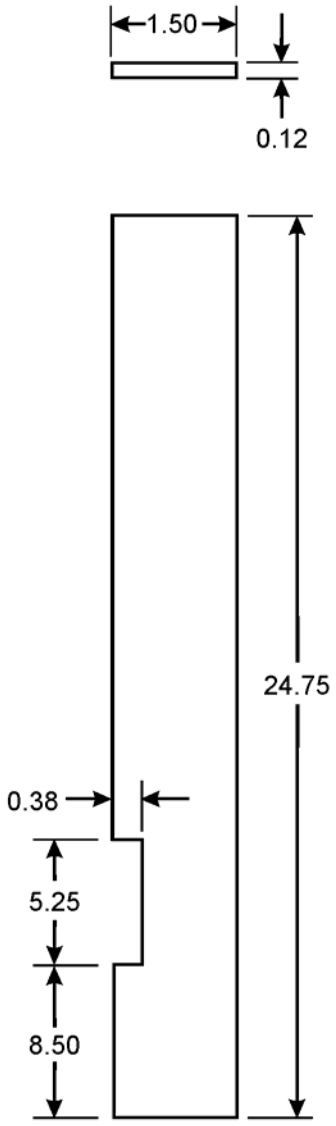
TABLE 1 ITEM NO.	PART NO.	A (INCHES)	B (INCHES)	QUANTITY
66	60370-11	39.00	1.50	2
67	60370-12	24.75	1.50	1

NOTE:

MAKE FROM RUBBER, NEOPRENE, SPONGE, ADHESIVE BACK, 0.12 INCH THICK, P/N 411NPSA (86730).

Gasket, Top Rear Panel Assembly P/N 60370-11 and -12

ILLUSTRATIONS OF MANUFACTURED ITEMS – Continued

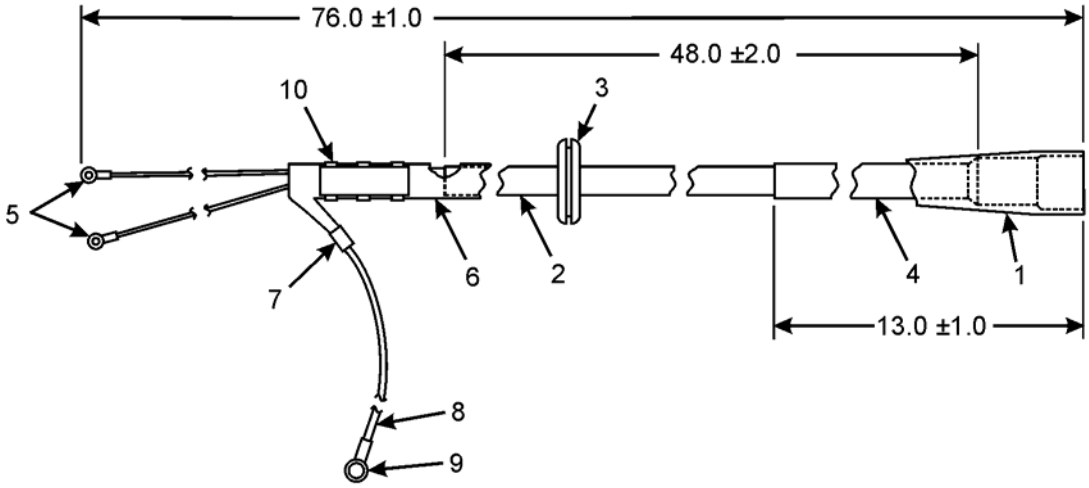


NOTE:

MAKE FROM RUBBER, NEOPRENE, SPONGE, ADHESIVE BACK, 0.12 INCH THICK, P/N 411NPSA (86730).

Gasket, Rear Panel Assembly P/N 60370-13

ILLUSTRATIONS OF MANUFACTURED ITEMS – Continued



NOTES:

MAKE FROM:

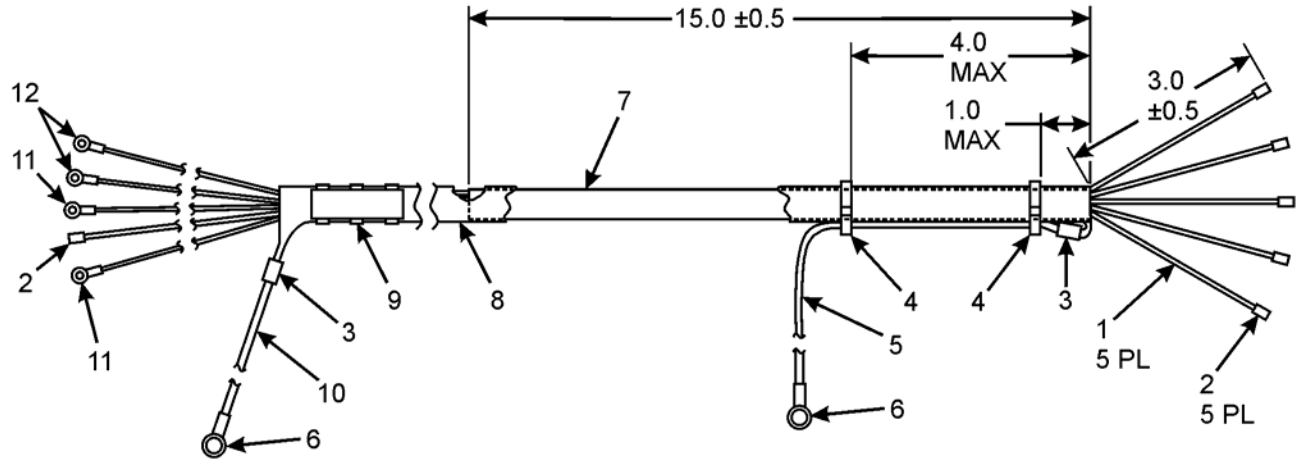
ILLUS ITEM NO.	DESCRIPTION	PART NO. (CAGEC)	SIZE (INCHES)	QUANTITY
1	DETECTOR, FLAME	60414-1 (90598)		1
2	TUBE, ACRYLIC, TUBULAR SLEEVING	60413-1 (79074)	48.0 ±2.0	1
3	GROMMET	MS35489-14 (96906)	–	1
4	SLEEVING, INSULATION	MS23053/5-109-0 (96906)	13.00 ±0.50	1
5	TERMINAL RING, 16 GAGE, #6 STUD	MS25036-106 (96906)	–	2
6	WIRE, BRAIDED, 1/2 IN. DIA	8669 (2W733)	60.0 ±1.0	1
7	BUTT SPLICE	52010-8 (94833)	–	1
8	WIRE, BRAIDED, 7/32 IN. DIA	8663 (2W733)	20.0 ±1.0	1
9	TERMINAL RING, 16 GAGE, 0.25 STUD	MS25036-157 (96906)	–	1
10	STRAP, ELECTRICAL TIEDOWN	MS3368-4-4D (96906)	–	1

BUTT ITEM NO. 2 AGAINST BODY OF ITEM NO. 1.

HEAT SHRINK ITEM NO. 4 AFTER ASSEMBLY IS COMPLETE.

Detector Assembly, Flame P/N 60414-101

ILLUSTRATIONS OF MANUFACTURED ITEMS – Continued



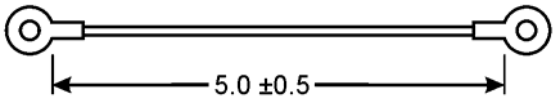
NOTES:

MAKE FROM:

ILLUS ITEM NO.	DESCRIPTION	PART NO. (CAGEC)	SIZE (INCHES)	QUANTITY
1	WIRE, ELECTRICAL, 16 GAGE, WHITE	M5086/1-16-7 OR MIL-W-22759/16-16-9 (81349)	75.0 ±1.0	5
2	TERMINAL, QUICK-CONNECT FEMALE	6043305 (0B6S1)	–	6
3	BUTT SPLICE, UNINSULATED	8031K21 (3A054)	–	2
4	STRAP, ELECTRICAL TIEDOWN	MS3367-1-9 (96906)	–	2
5	WIRE, BRAIDED, 7/32 IN. DIA	8663 (2W733)	8.0 ±1.0	1
6	TERMINAL RING, 12 GAGE, 0.25 STUD	MS25036-157 (96906)	–	2
7	SLEEVING, INSULATION	MS23053/5-109-0 (96906)	10.0 ±0.25	1
8	WIRE, BRAIDED, 1/2 IN. DIA	8669 (2W733)	60.0 ±1.0	1
9	STRAP, ELECTRICAL TIEDOWN	MS3368-4-4D (96906)	–	1
10	WIRE, BRAIDED, 7/32 IN. DIA	8663 (2W733)	20.0 ±1.0	1
11	TERMINAL RING, 16 GAGE, #6 STUD	MS25036-106 (96906)	–	2
12	TERMINAL RING, 16 GAGE, #8	MS25036-153 (96906)	–	2

Wire Harness, Thermostats P/N 60440-101

ILLUSTRATIONS OF MANUFACTURED ITEMS – Continued



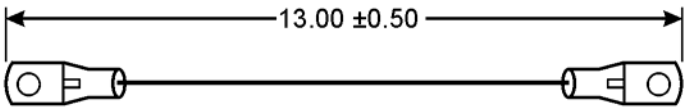
NOTES:

MAKE FROM:

WIRE ROPE, CRES, P/N 8930T33 (39428)
TERMINAL RING, 12 GAGE, #10, P/N MS25036-112 (96906)
TERMINAL RING, 12 GAGE, 1/4 STUD, P/N MS25036-157 (96906)

STRIP ENDS OF WIRE ROPE; CRIMP TERMINAL RINGS IN PLACE.

Cable, Exhaust Port Cover P/N 60558-2



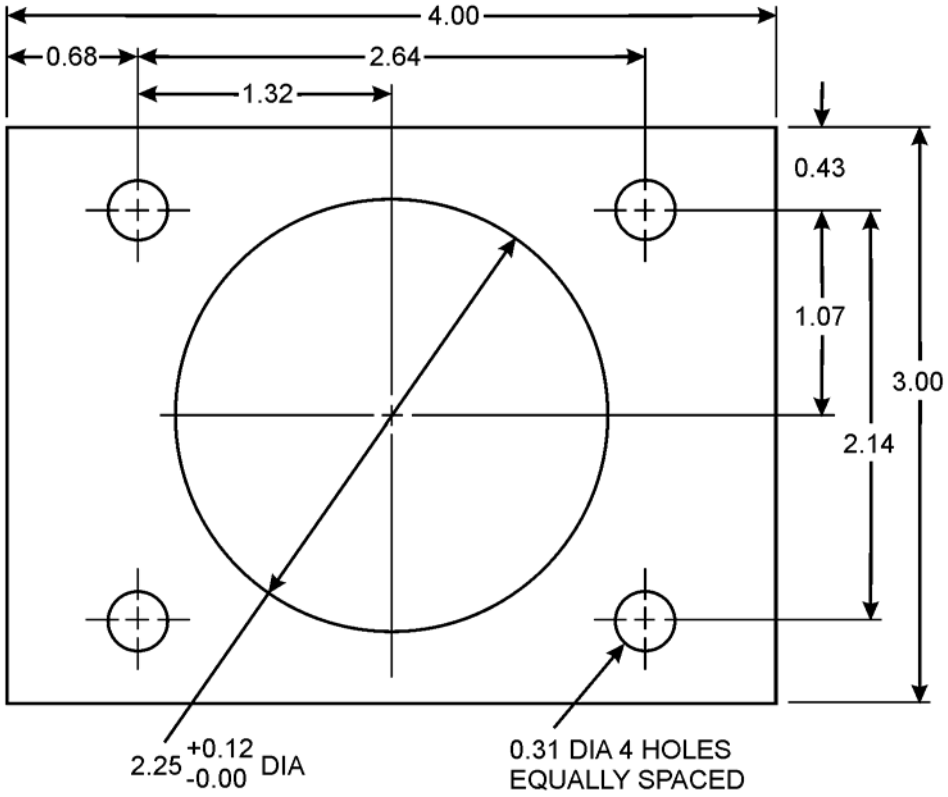
NOTES:

MAKE FROM:

WIRE ROPE, CRES, P/N 879447-01, NSN 4010-00-575-6233 (18894)
TERMINAL LUG, NSN 5940-00-113-9824 (09922), 2 REQUIRED

Cable, Duct Cover Assembly P/N 60565-4

ILLUSTRATIONS OF MANUFACTURED ITEMS – Continued

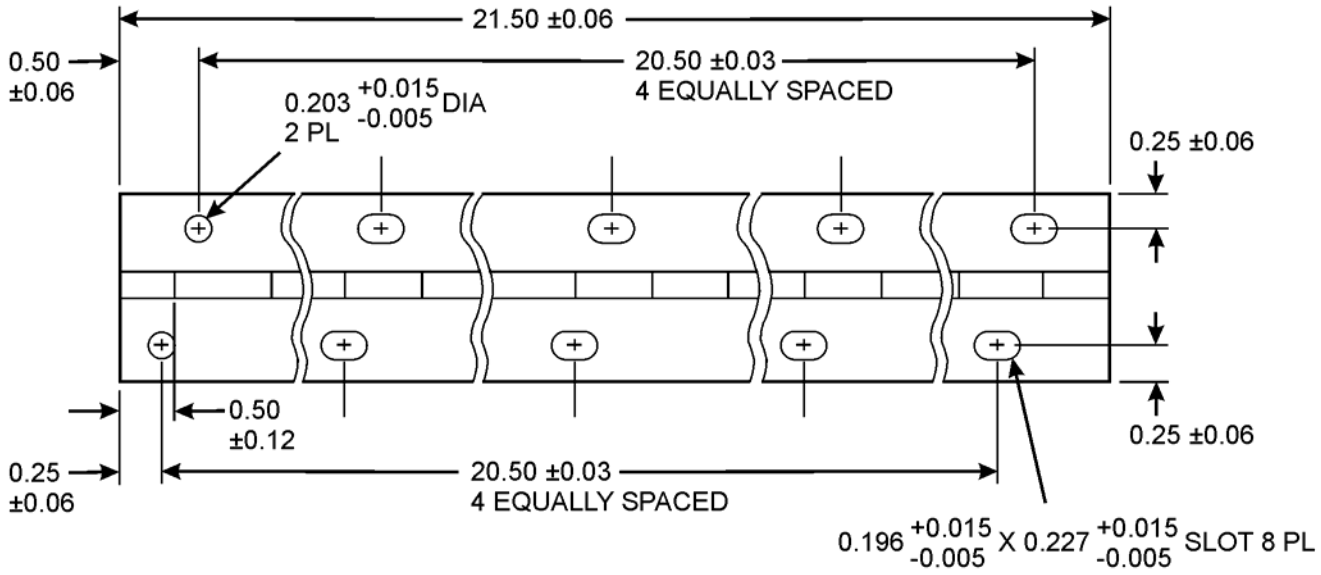


NOTE:

MAKE FROM BUNA-N-RUBBER SHEETING, 0.06 INCH THICK, PER ASTM D-2000-86E, TYPE BG, BLACK, HARDNESS 45-55, P/N 8635K542 (39428).

Gasket, Combustion Air Outlet P/N 60588-1

ILLUSTRATIONS OF MANUFACTURED ITEMS – Continued

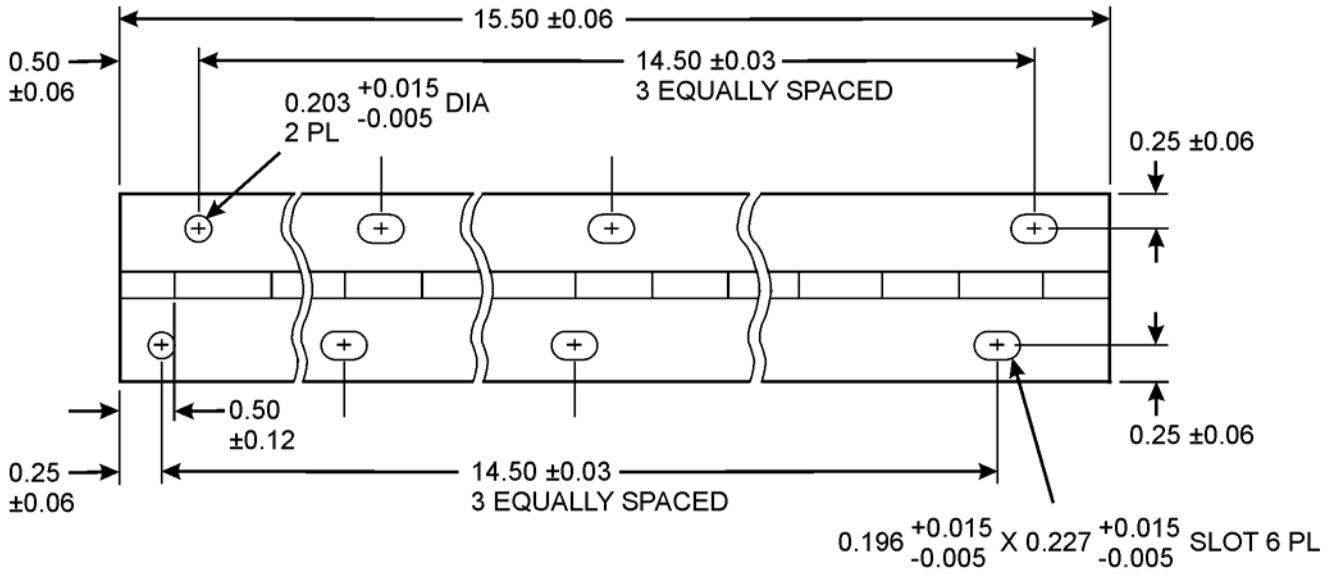


NOTE:

MAKE FROM HINGE, 1.25 INCH WIDE, 0.050 INCH THICK, P/N MS20257C3-4800 (96906).

Hinge P/N 60617-1

ILLUSTRATIONS OF MANUFACTURED ITEMS – Continued

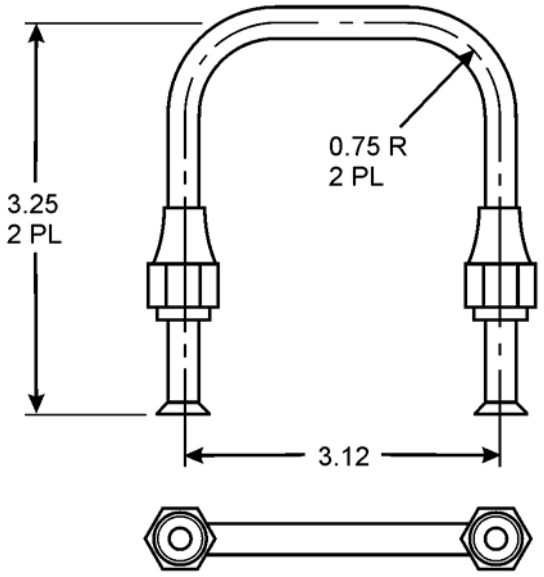


NOTE:

MAKE FROM HINGE, 1.25 INCH WIDE, 0.050 INCH THICK, P/N MS20257C3-4800 (96906).

Hinge P/N 60625-1

ILLUSTRATIONS OF MANUFACTURED ITEMS – Continued



NOTES:

ADDITIONAL TOOLS REQUIRED: TUBE BENDING SET AND FLARING TOOL (ITEM 6, WP 0058 00).

MAKE FROM COPPER TUBE, SEAMLESS, 0.25 INCH O.D. X 0.030 INCH WALL, PER ASTM B280-83.

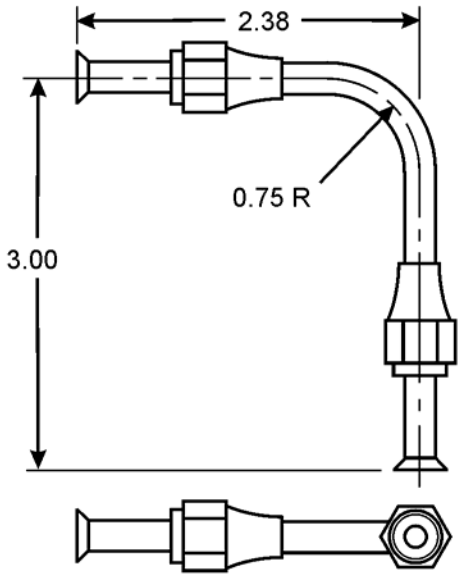
CUT LENGTH 9.15 INCHES. CUT TO SIZE AND BEND AS SHOWN.

INSTALL 2 TUBE NUTS, P/N 60764-2.

DOUBLE FLARE 45° PER SAE J533.

Tube Assembly, Fuel Pump P/N 60755-100

ILLUSTRATIONS OF MANUFACTURED ITEMS – Continued



NOTES:

ADDITIONAL TOOLS REQUIRED: TUBE BENDING SET AND FLARING TOOL (ITEM 6, WP 0058 00).

MAKE FROM COPPER TUBE, SEAMLESS, 0.25 INCH O.D. X 0.030 INCH WALL, PER ASTM B280-83.

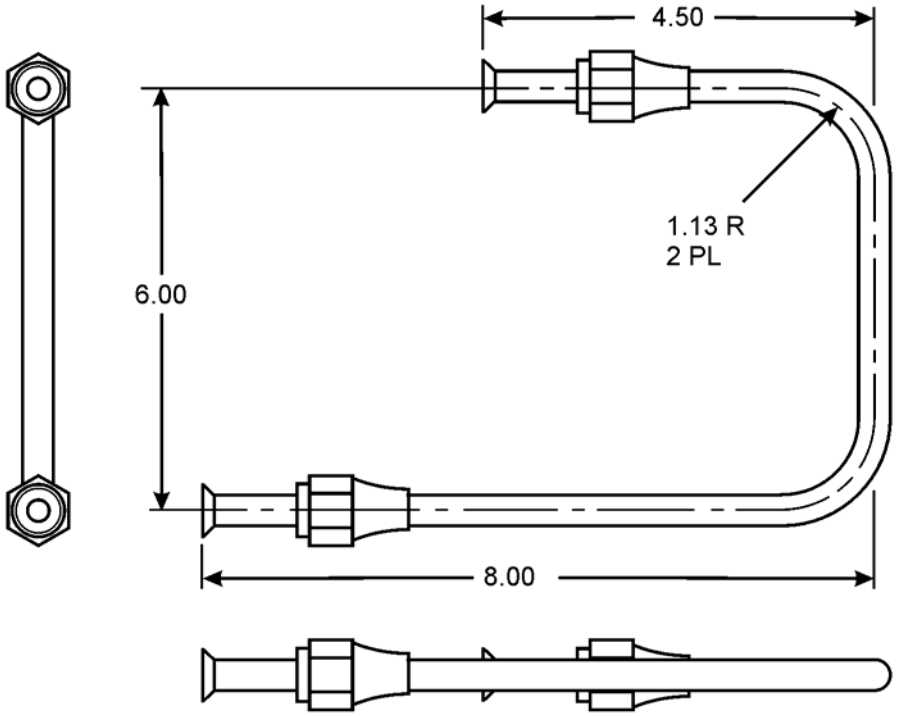
CUT LENGTH 5.00 INCHES. CUT TO SIZE AND BEND AS SHOWN.

INSTALL 2 TUBE NUTS, P/N 60764-2.

DOUBLE FLARE 45° PER SAE J533.

Tube Assembly, Fuel Pump P/N 60756-100

ILLUSTRATIONS OF MANUFACTURED ITEMS – Continued



NOTES:

ADDITIONAL TOOLS REQUIRED: TUBE BENDING SET AND FLARING TOOL (ITEM 6, WP 0058 00).

MAKE FROM COPPER TUBE, SEAMLESS, 0.25 INCH O.D. X 0.030 INCH WALL, PER ASTM B280-83.

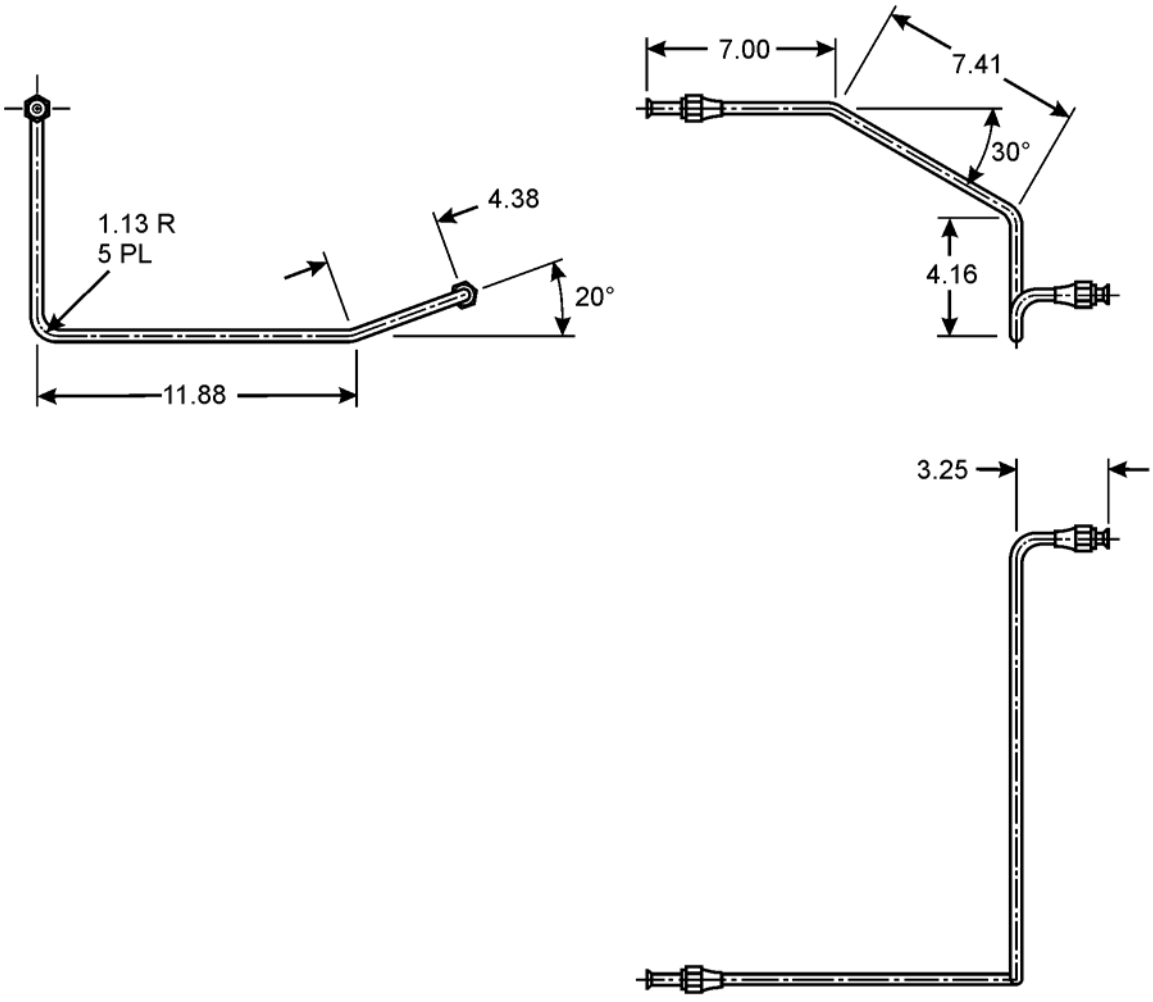
CUT LENGTH 17.75 INCHES. CUT TO SIZE AND BEND AS SHOWN.

INSTALL 2 TUBE NUTS, P/N 60764-3.

DOUBLE FLARE 45° PER SAE J533.

Tube Assembly, Fuel Tank/Rear Panel P/N 60757-100

ILLUSTRATIONS OF MANUFACTURED ITEMS – Continued



NOTES:

ADDITIONAL TOOLS REQUIRED: TUBE BENDING SET AND FLARING TOOL (ITEM 6, WP 0058 00).

MAKE FROM COPPER TUBE, SEAMLESS, 0.25 INCH O.D. X 0.030 INCH WALL, PER ASTM B280-83.

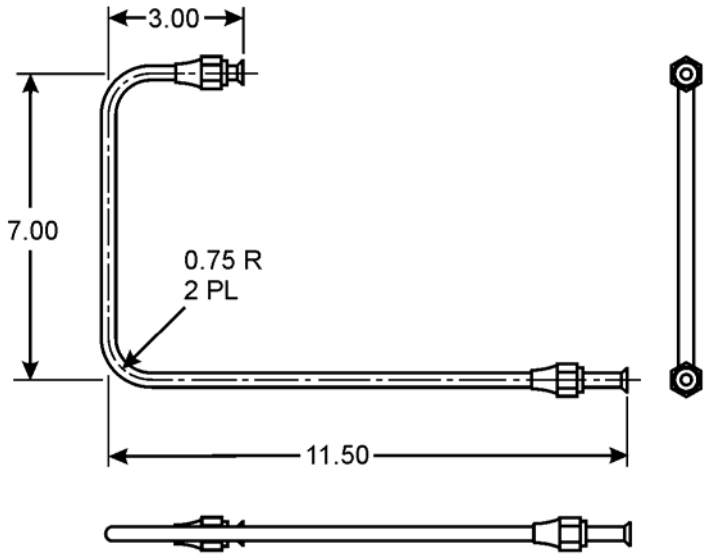
CUT TO SIZE AND BEND AS SHOWN.

INSTALL 2 TUBE NUTS, P/N 60764-3.

DOUBLE FLARE 45° PER SAE J533.

Tube Assembly, Rear Panel/Fuel Tank P/N 60758-100

ILLUSTRATIONS OF MANUFACTURED ITEMS – Continued



NOTES:

ADDITIONAL TOOLS REQUIRED: TUBE BENDING SET AND FLARING TOOL (ITEM 6, WP 0058 00).

MAKE FROM COPPER TUBE, SEAMLESS, 0.25 INCH O.D. X 0.030 INCH WALL, PER ASTM B280-83.

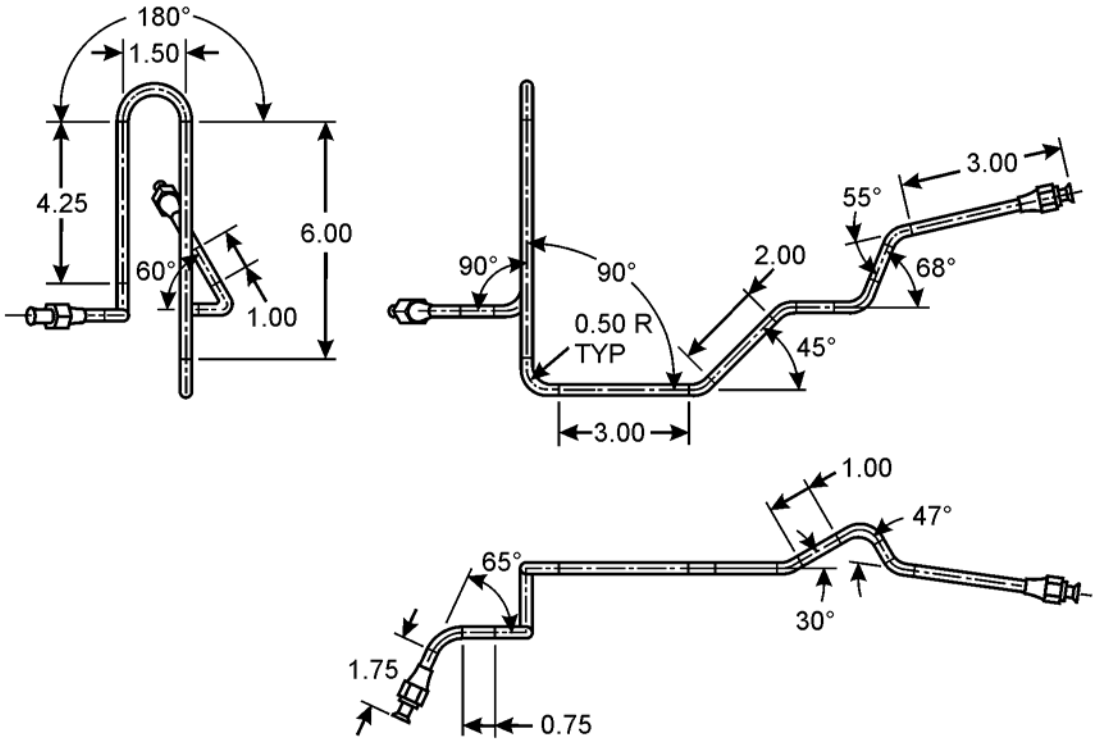
CUT TO SIZE AND BEND AS SHOWN.

INSTALL 2 TUBE NUTS, P/N 60764-2.

DOUBLE FLARE 45° PER SAE J533.

Tube Assembly, Solenoid/Fuel Tank P/N 60759-100

ILLUSTRATIONS OF MANUFACTURED ITEMS – Continued



NOTES:

ADDITIONAL TOOLS REQUIRED: TUBE BENDING SET AND FLARING TOOL (ITEM 6, WP 0058 00).

MAKE FROM COPPER TUBE, SEAMLESS, 0.25 INCH O.D. X 0.030 INCH WALL, PER ASTM B280-83.

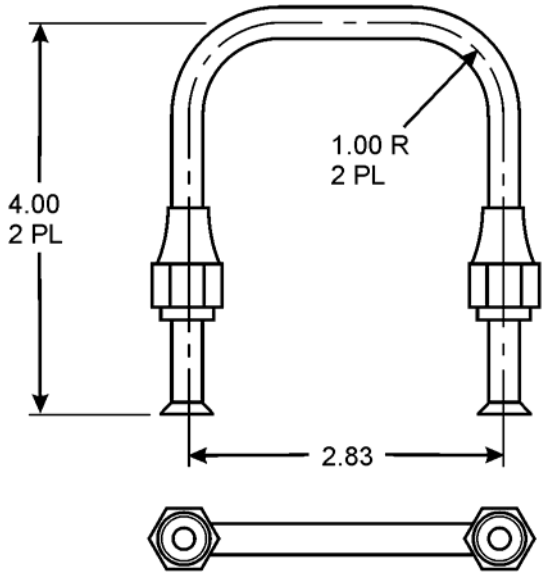
CUT TO SIZE AND BEND AS SHOWN.

INSTALL 2 TUBE NUTS, P/N 60764-1.

DOUBLE FLARE 45° PER SAE J533.

Tube Assembly, Gage P/N 60761-100

ILLUSTRATIONS OF MANUFACTURED ITEMS – Continued



NOTES:

ADDITIONAL TOOLS REQUIRED: TUBE BENDING SET AND FLARING TOOL (ITEM 6, WP 0058 00).

MAKE FROM COPPER TUBE, SEAMLESS, 0.375 INCH O.D. X 0.032 INCH WALL, PER ASTM B280-83.

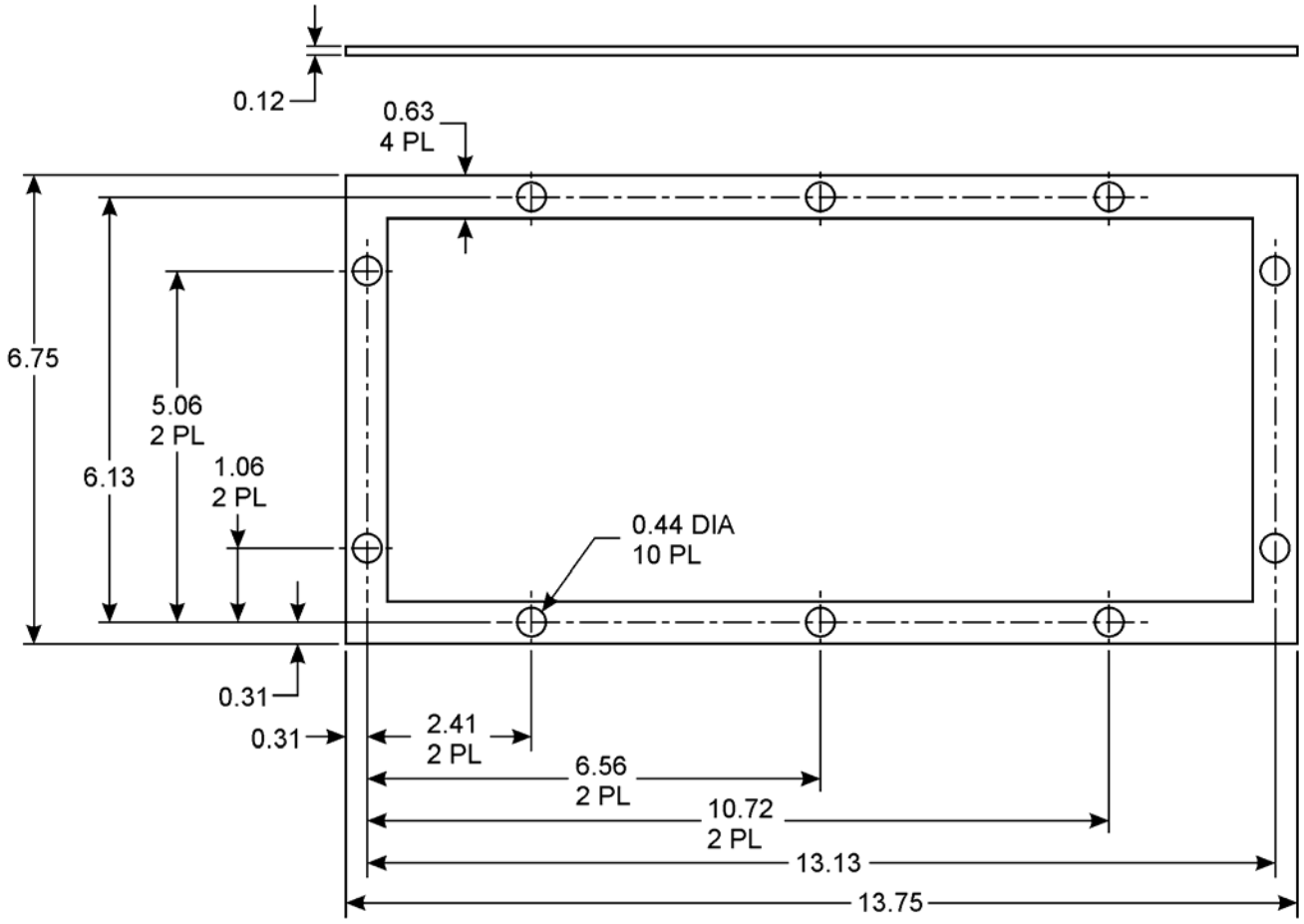
CUT TO LENGTH 10.62 INCHES. CUT TO SIZE AND BEND AS SHOWN.

INSTALL 2 TUBE NUTS, P/N 60764-3.

DOUBLE FLARE 45° PER SAE J533.

Tube Assembly, Rear Panel P/N 60762-100

ILLUSTRATIONS OF MANUFACTURED ITEMS – Continued

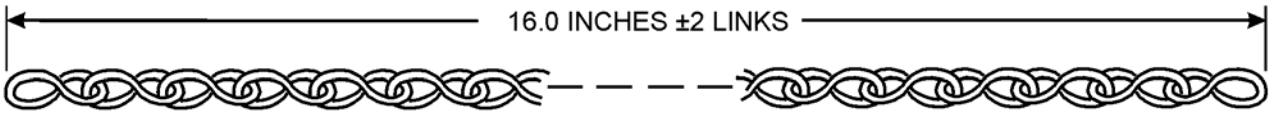


NOTE:

MAKE FROM RUBBER, CELLULAR, CHEMICALLY BLOWN, PER MIL-R-6130, TYPE II, GRADE A, CONDITION SOFT, 0.125 INCH THICK, ADHESIVE BACKED, NSN 9320-01-163-2054 (81349).

Gasket, Remote Control Box P/N 60766-1

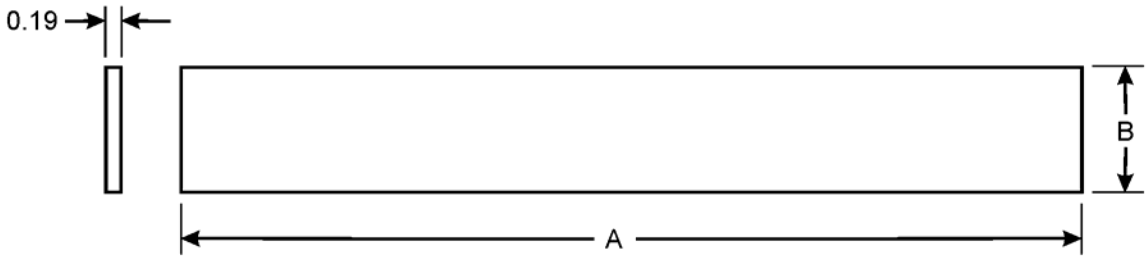
ILLUSTRATIONS OF MANUFACTURED ITEMS – Continued



NOTE:

MAKE FROM SINGLE JACK CHAIN, P/N 3603T76.

Chain, Remote Control Box P/N 60770-5



TABE 1 ITEM NO.	PART NO.	A (INCHES)	B (INCHES)	QUANTITY
85	60780-14	10.93 ±0.06	1.25	2
86	60780-15	14.78 ±0.06	1.25	2

NOTE:

MAKE FROM RUBBER, CELLULAR, CHEMICALLY BLOWN, PER MIL-R-6130, TYPE II, GRADE A, CONDITION SOFT, 0.12 INCH THICK, ADHESIVE BACKED, NSN 9320-01-163-2054 (81349).

Gasket, Control Box P/N 60780-14 and -15

ILLUSTRATIONS OF MANUFACTURED ITEMS – Continued

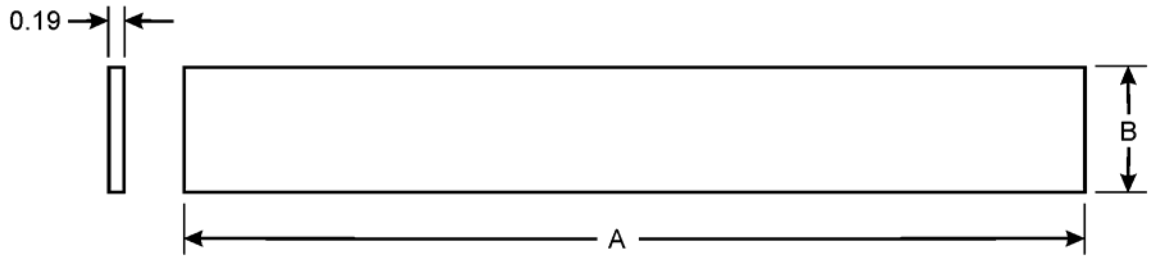


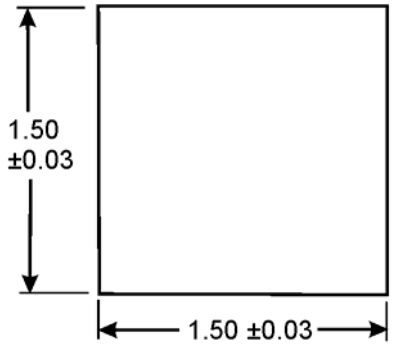
TABLE 1 ITEM NO.	PART NO.	A (INCHES)	B (INCHES)	QUANTITY
87	60781-3	9.00 ±0.13	0.62 – 0.67	2
88	60781-4	13.90 ±0.13	0.62 – 0.67	2

NOTE:

MAKE FROM RUBBER, CELLULAR, CHEMICALLY BLOWN, PER MIL-R-6130, TYPE II, GRADE A, CONDITION MEDIUM, 0.19 INCH THICK, ADHESIVE BACKED, NSN 9320-01-101-2994 (81349).

Gasket, Control Box Lid P/N 60781-3 and -4

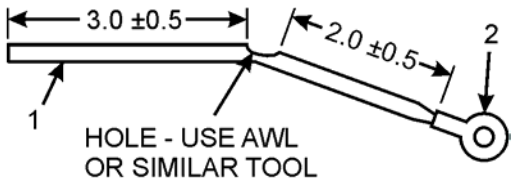
ILLUSTRATIONS OF MANUFACTURED ITEMS – Continued



NOTE:

MAKE FROM RUBBER, NEOPRENE, SPONGE, ADHESIVE BACK, 0.75 INCH THICK, P/N R411NPSA (86730).

Gasket, Transformer Assembly P/N 60840-5

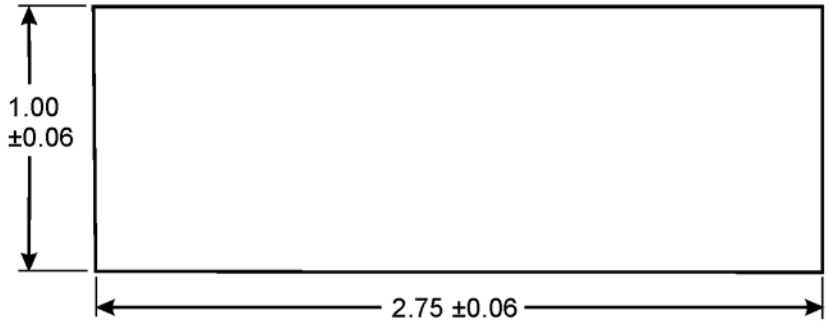


NOTE:

MAKE FROM WIRE, BRAIDED, 12 AWG, P/N 8663 (2W733).

Shield, Braided, Transformer P/N 60840-16

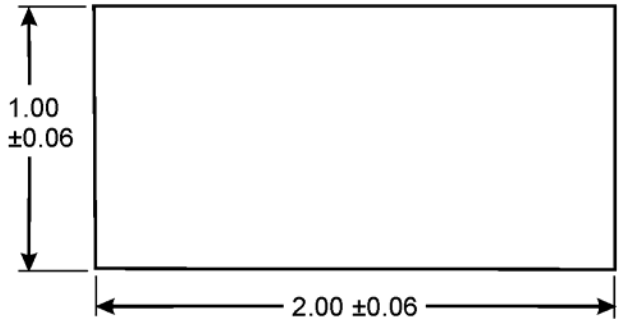
ILLUSTRATIONS OF MANUFACTURED ITEMS – Continued



NOTE:

MAKE FROM RUBBER, NEOPRENE, SPONGE, ADHESIVE BACK, 0.125 INCH THICK, P/N R411NPSA (86730).

Gasket, Capacitor Bracket P/N 60841-2

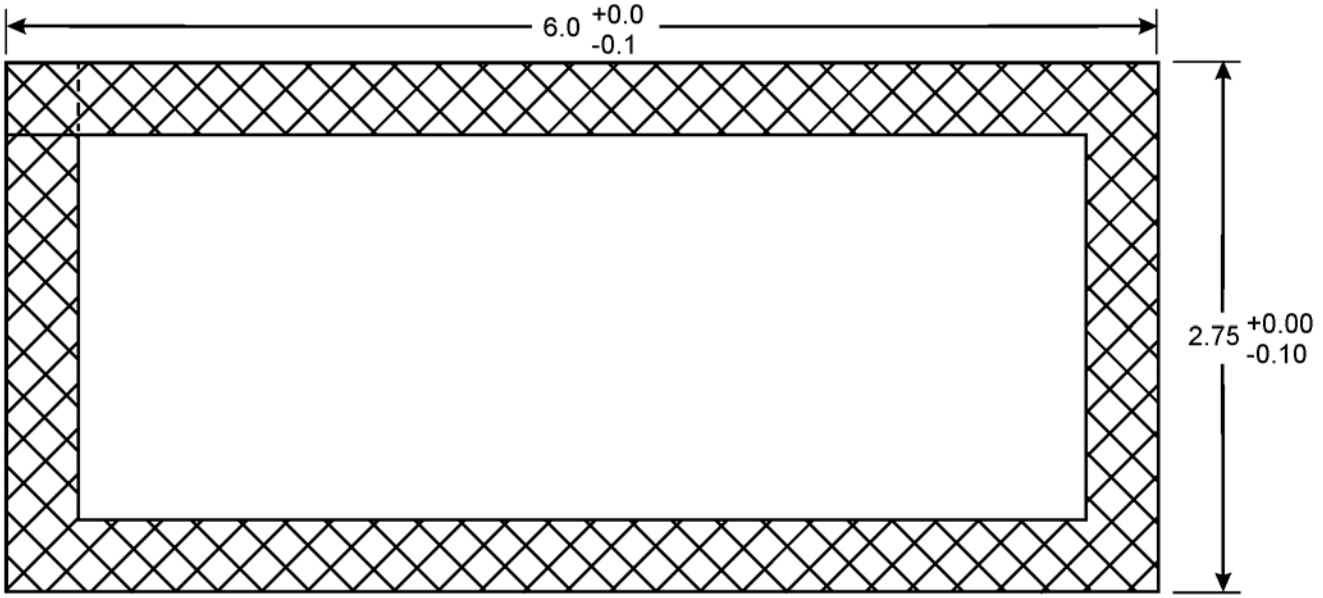


NOTE:

MAKE FROM RUBBER, NEOPRENE, SPONGE, ADHESIVE BACK, 0.125 INCH THICK, P/N R411NPSA (86730).

Gasket, Transformer Lid P/N 60843-4

ILLUSTRATIONS OF MANUFACTURED ITEMS – Continued

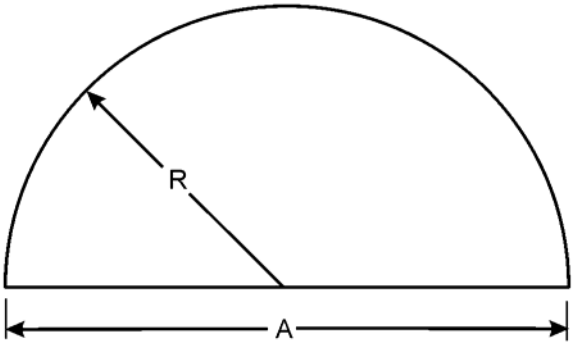


NOTE:

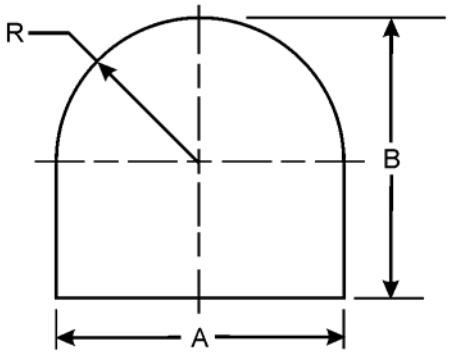
MAKE FROM RUBBER AND WIRE MESH, ADHESIVE BACK, P/N 01-0604-1756 (57003).

Gasket, EMI P/N 60843-7

ILLUSTRATIONS OF MANUFACTURED ITEMS – Continued



60873-1



60873-2

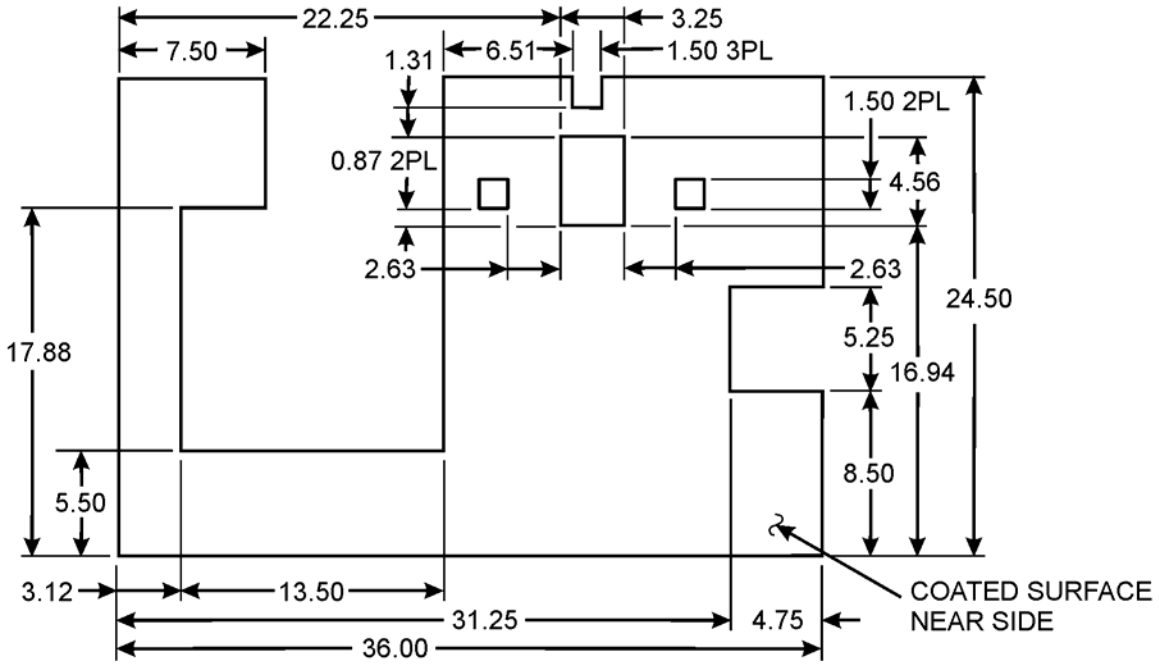
TABLE 1 ITEM NO.	PART NO.	RADIUS (R)	DIM A (INCHES)	DIM B (INCHES)
94	60873-1	6.88 ±0.12	13.76 ±0.12	2
95	60873-2	0.88 ±0.12	1.75 ±0.12	1.75 ±0.12

NOTE:

MAKE FROM RUBBER INSULATION SHEET, 0.50 INCH THICK, ENSOLITE TYPE MLC, BLACK (0W711).

Insulation P/N 60873-1 and -2

ILLUSTRATIONS OF MANUFACTURED ITEMS – Continued



NOTES:

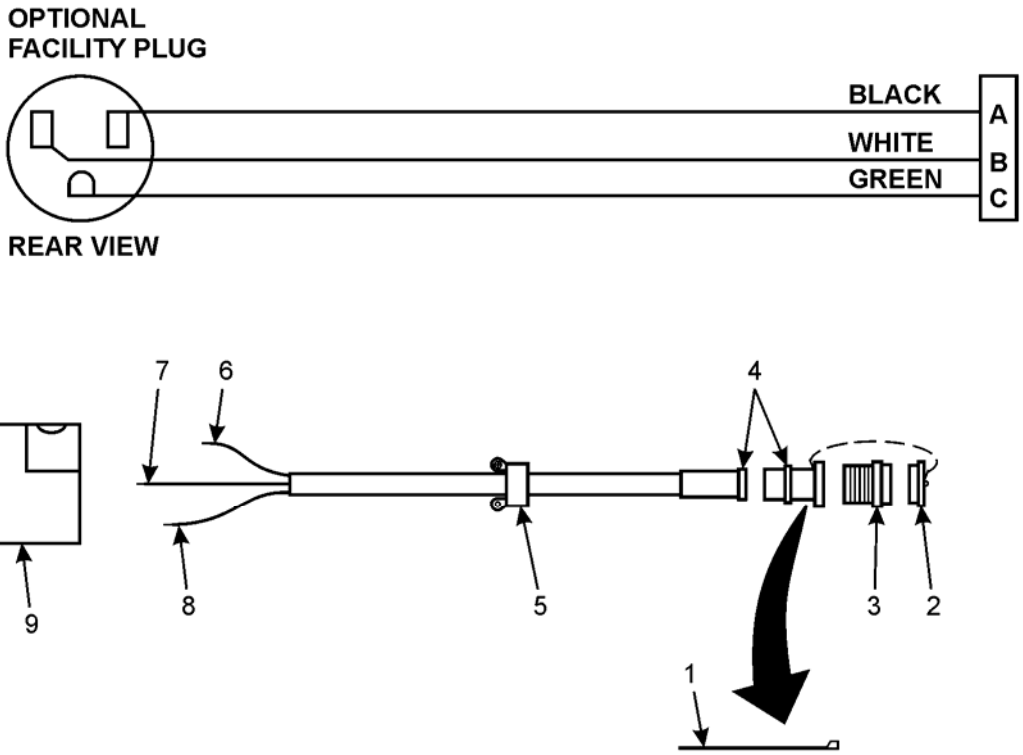
MAKE FROM RUBBER INSULATION SHEET, 0.50 INCH THICK, ENSOLITE TYPE MLC, BLACK (OW711).

IF NOT DIE CUT, TOLERANCES ARE AS FOLLOWS:

DIMENSIONS LESS THAN 2.00 INCHES = ±0.12
DIMENSIONS 2.00 TO 4.00 INCHES = ±0.19
DIMENSIONS GREATER THAN 4.00 INCHES = ±0.25

Insulation, Rear Panel Assembly P/N 60881-1

ILLUSTRATIONS OF MANUFACTURED ITEMS – Continued



NOTES:
MAKE FROM:

ILLUS ITEM NO.	DESCRIPTION	PART NO. (CAGEC)	SIZE (INCHES)	QUANTITY
1	STRAP, TIEDOWN, ELECTRICAL	MS3367-5-9 (96906)	–	1
2	COVER, ELECTRICAL, WITH ATTACHING LINK CHAIN	MS25043-16DA (96906)	–	1
3	CONNECTOR, RECEPTACLE	MS3401D16-10S (96906)	–	1
4	BUSHING, NONMETALLIC	MS3420-6 (96906)	–	1
5	ADAPTER, CABLE CLAMP	M85049/11-112W (81349)	–	1
6	WIRE, ELECTRICAL, 12 GAGE, WHITE	M5086/1-12-0 (81349)	36.0 ±1.0	5
7	WIRE, ELECTRICAL, 12 GAGE, WHITE	M5086/1-12-9 (81349)	36.0 ±1.0	5
8	WIRE, ELECTRICAL, 12 GAGE, WHITE	M5086/1-16-5 (81349)	36.0 ±1.0	5
9	HOSPITAL GRADE TYPE PLUG	8315C (74545)	–	1

Adapter, Power Cable P/N 13229E8567

END OF WORK PACKAGE

UNIT MAINTENANCE INSTRUCTIONS

ARMY SPACE HEATER H-140

NSN 4520-01-477-0568

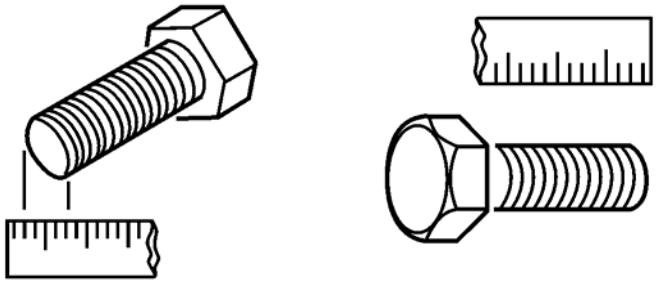
TORQUE LIMITS

INTRODUCTION

This work package contains the torque standards for specific types and sizes of hardware. It defines the different types of bolts by grade. Special torque values and sequences are listed in the specific maintenance procedure. See Chapter 6 for unit maintenance or Chapter 7 for direct support maintenance.

TORQUE TABLES

How to Use Torque Tables 1 and 2



1. Measure diameter of screw being installed.
2. Count number of threads per inch or use a pitch grade.
3. Under heading SIZE, look down DIA IN. column until you find diameter of screw being installed. (There will usually be two lines beginning with same size.)
4. Under heading SIZE, look down THREADS PER IN. column to find numbers of threads per inch that match number of threads counted in step 2. (Not required for metric screws.)

TORQUE TABLES – Continued

NOTE

Manufacturer's marks may vary. Standard is all SAE Grade 5 (3-line). Metric screws are of three grades: 8.8, 10.9, and 12.9. Grades and manufacturer's marks appear on the screw head.

5. To find the grade screw being installed, match markings on screw head to correct picture of CAPSCREW HEAD MARKINGS in illustration preceding respective torque table.

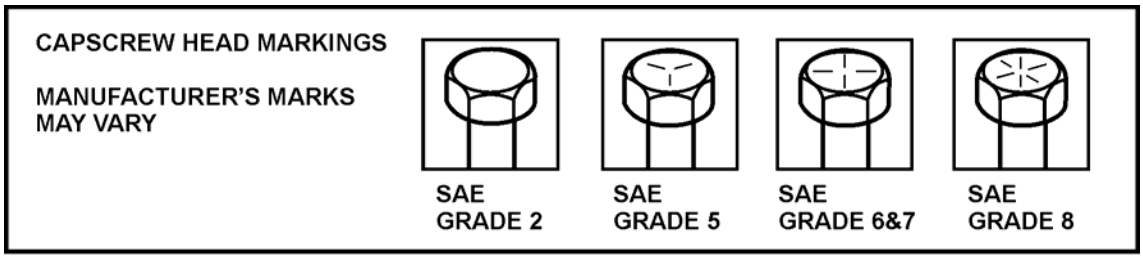


Table 1. Standard Dry Torque Limits.

SIZE			SAE GRADE NO. 2		SAE GRADE NO. 5		SAE GRADE NO. 6 OR 7		SAE GRADE NO. 8	
DIA IN.	THREADS PER IN.	DIA MM	LB-FT	NM	LB-FT	NM	LB-FT	NM	LB-FT	NM
1/4	20	6.35	5	7	8	11	10	14	12	16
1/4	28	6.35	6	9	10	14	12	16	14	19
5/16	18	7.94	11	15	17	23	21	28	25	34
5/16	24	7.94	12	16	19	26	24	33	25	34
3/8	16	9.53	20	27	30	41	40	54	45	61
3/8	24	9.53	23	31	35	47	45	61	50	68
7/16	14	11.11	30	41	50	68	60	81	70	95
7/16	20		35	47	55	75	70	95	90	108
1/2	13	12.70	50	68	75	102	95	129	110	149
1/2	20		55	75	90	122	100	135	120	163
9/16	12	14.29	65	85	110	149	135	183	150	203
9/16	18		75	102	120	163	150	203	170	231
5/8	11	15.88	90	122	150	203	190	258	220	298
5/8	18		100	136	180	244	210	285	240	325

TORQUE TABLES – Continued

Table 1. Standard Dry Torque Limits – Continued.

SIZE			SAE GRADE NO. 2		SAE GRADE NO. 5		SAE GRADE NO. 6 OR 7		SAE GRADE NO. 8	
DIA IN.	THREADS PER IN.	DIA MM	LB-FT	NM	LB-FT	NM	LB-FT	NM	LB-FT	NM
3/4	10	19.05	160	217	260	353	240	434	380	515
3/4	16		180	244	300	407	360	488	420	597
7/8	9	22.23	140	190	400	542	520	705	600	814
7/8	14		155	210	440	597	580	786	660	895
1	8	25.40	220	298	580	786	800	1085	900	1220
1	12		240	325	640	868	860	1166	1000	1350
1-1/8	7	25.58	300	407	800	1085	1120	1519	1280	1736
1-1/8	12		340	461	880	1193	1260	1709	1440	1953
1-1/4	7	31.75	420	570	1120	1519	1580	2142	1820	2468
1-1/4	12		460	624	1240	1681	1760	2387	2000	2712
1-3/8	6	34.93	560	759	1460	1980	2080	2820	2380	3227
1-3/8	12		640	868	1680	2278	2360	3227	2720	3688
1-1/2	6	38.10	740	1003	1940	2631	2780	3770	3160	4285
1-1/2	12		840	1139	2200	2983	3100	4204	3560	4827

TORQUE TABLES – Continued

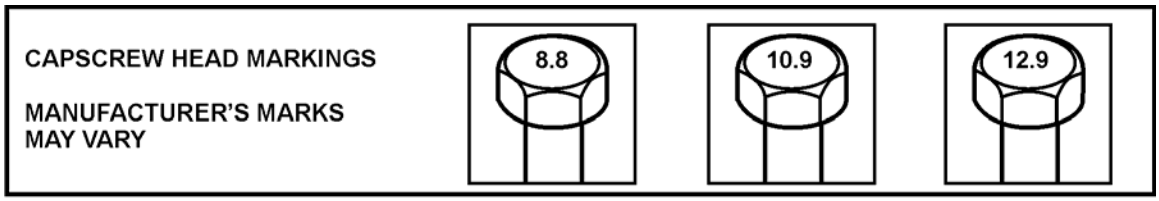


Table 2. Metric Dry Torque Limits.

SIZE		METRIC GRADE 8.8		METRIC GRADE 10.9		METRIC GRADE 12.9	
DIA IN.	DIA MM	LB-FT	NM	LB-FT	NM	LB-FT	NM
0.157	4	2	3	3	4	4	5
0.197	5	4	5	6	8	7	9
0.237	6	7	9	10	14	11	15
0.276	7	11	15	16	32	20	27
0.315	8	18	24	25	34	29	39
0.394	10	32	43	47	64	58	79
0.473	12	58	79	83	113	100	136
0.630	16	144	195	196	266	235	319
0.709	18	190	258	269	365	323	438
0.788	20	260	353	366	496	440	597
0.867	22	368	499	520	705	678	919
0.946	24	470	637	664	900	794	1077
1.064	27	707	959	996	1351	1235	1675
1.182	30	967	1311	1357	1840	1630	2210

END OF WORK PACKAGE

UNIT MAINTENANCE INSTRUCTIONS

ARMY SPACE HEATER H-140

NSN 4520-01-477-0568

WIRE LISTS

INTRODUCTION

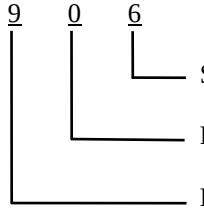
This work package describes the wire lists for the ASH (Table 1) and the remote control box (Table 2). The wire lists are used in conjunction with the ASH electrical system schematic diagram (Figure FO-1) during troubleshooting and repair. All wiring information is provided, including wire gage, color, wire type by part number/specification, terminations, and wire splice data.

ABBREVIATIONS

All abbreviations are in accordance with ASME Y14.38.

NOTES

1. Wire colors are identified as follows:



Color Code

0	Black	5	Green
1	Brown	6	Blue
2	Red	7	Violet
3	Orange	8	Gray
4	Yellow	9	White

For example, wire M5086/1-16-906 is a white wire with a black first tracer and a blue second tracer.

2. Wire type, terminations, and splices listed in Tables 1 and 2 are described as follows:

A = Wire, M5086/1-18
B = Wire, M5086/1-16
C = Wire, M5086/1-12
D = Terminal lug, 18 GA, #6 stud, MS 25036-102
E = Terminal lug, 18 GA, #1/4 stud, MS25036-150
F = Terminal lug, 16 GA, #6 stud, MS25036-106
G = Terminal lug, 16 GA, #8 stud, MS25036-153
H = Terminal lug, 16 GA, #10 stud, MS25036-108
I = Terminal lug, 16 GA, #1/4 stud, MS25036-154
J = Terminal lug, 12 GA, #8 stud, MS25036-156
K = Terminal lug, 12 GA, #10 stud, MS25036-112
L = Terminal lug, 12 GA, #1/4 stud, MS25036-157
M = Wire nut, electrical
N = Terminal, insulated quick-connect, female, MNV14-250DFI
O = Marker, heat shrinkable
P = Terminal, splice, crimp style
Q = Jumper, side-to-side
R = Jumper, deck-to-deck
S = Jumper, terminal board

3. Polarity is indicated by POS or NEG.

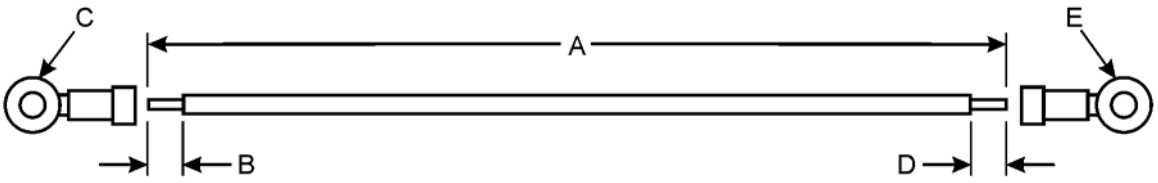
4. Each wire is marked with from/to terminal destinations.

5. Part of cable assembly 60252-1.

NOTES – Continued

6. Part of cable assembly 60775-1.

7. Letters on the following illustration are keyed to the letters in the wire list column headings.



WIRE LISTS

Table 1. ASH Wire List.

WIRE ASSY NO.	WIRE TYPE/ COLOR	WIRE LENGTH INCHES (A)	STRIP LENGTH (B)	TERMINAL INDEX (C)	FROM	TO	STRIP LENGTH (D)	TERMINAL INDEX (E)
1	B-9	12.0	0.25	N	DS1	K2-14	0.38	–
2	B-9	17.0	0.25	N	DS1	TB1-2	0.25	G
3	B-9	75.0	0.25	N	DS2	S2-2	0.25	N
4	B-9	17.0	0.25	I	G	P1-C	0.25	G
5	B-9	17.0	0.25	I	G	TR2-G	0.25	H
6	C-9	49.0	0.38	L	GND	B1-GND	0.38	K
7	B-9	14.0	0.25	I	GND	B2-GRN	0.25	P
8	NOTE 5	54.0	–	–	J3-A	S1-67	0.25	G
9	NOTE 5	54.0	–	–	J3-B	TB2-2	0.25	G
10	NOTE 5	54.0	–	–	J3-C	GND	0.25	E
11	NOTE 5	54.0	–	–	J3-D	S1-57	0.25	G
12	NOTE 5	54.0	–	–	J3-E	TB3-4	0.25	G
13	NOTE 5	54.0	–	–	J3-F	TB3-7	0.25	G
14	NOTE 5	54.0	–	–	J3-G	TB3-5	0.25	G
15	NOTE 5	54.0	–	–	J3-H	TB3-6	0.25	G
16	B-9	18.0	0.25	–	K1	TB2-8	0.25	G
17	B-9	14.0	0.25	–	K1	TB3-2	0.25	F
18	B-9	16.0	0.25	–	K1	TB2-1	0.25	G
19	B-9	14.0	0.25	–	K1	TB3-5	0.25	F
20	B-9	11.0	0.25	–	K1	GND	0.25	I
21	B-9	24.0	0.25	–	K1	CO-3	0.25	P
22	B-9	11.0	0.25	–	K1 P2	TB1-6	0.25	G
23	B-9	17.0	0.25	–	K1 P3	DS3	0.25	N
24	B-9	5.0	0.25	–	K1 P4	TB1-5	0.25	G
25	B-9	11.0	0.25	–	K1 P5	TB3-4	0.25	F
26	B-9	12.0	0.25	–	K1 P6	TB3-3	0.25	F
27	B-9	14.0	0.25	–	K1 P7	TB3-1	0.25	F
28	B-9	13.0	0.25	–	K1 P8	TB3-6	0.25	F
29	B-9	24.0	0.25	–	K1 P10	CO-1	0.25	P
30	B-9	24.0	0.25	–	K1 P11	CO-2	0.25	P
31	B-9	10.0	0.25	–	K1 P12	TB1-4	0.25	G
32	B-9	17.0	0.25	–	K1 P13	S1-27	0.25	F
33	B-9	20.0	0.25	–	K1 P15	S7-2	0.25	F
34	B-9	8.0	0.25	–	K1 P17	TB1-7	0.25	G

WIRE LISTS – Continued

Table 1. ASH Wire List – Continued.

WIRE ASSY NO.	WIRE TYPE/ COLOR	WIRE LENGTH INCHES (A)	STRIP LENGTH (B)	TERMINAL INDEX (C)	FROM	TO	STRIP LENGTH (D)	TERMINAL INDEX (E)
35	B-9	17.0	0.25	–	K1 P18	S1-47	0.25	F
36	C-9	40.0	0.38	–	K2-2	B1-T4, T8	0.38	M
37	C-9	11.0	0.38	–	K2-4	K2-5	0.38	–
38	C-9	40.0	0.38	–	K2-6	B1-T1, T5	0.38	M
39	C-0	370.0	0.25	–	P1-A	TB1-1	0.25	J
40	C-9	370.0	0.25	–	P1-B	TB1-2	0.25	J
41	C-9	370.0	0.25	–	P1-C	G	0.25	L
42	B-9	13.0	0.25	F	S1-11	TB1-2	0.25	G
43	B-9	16.0	0.25	F	S1-12	TB2-4	0.25	G
44	JUMPER	–	–	Q	S1-12	S1-13	–	–
45	JUMPER	–	–	Q	S1-13	S1-14	–	–
46	B-9	4.0	0.25	F	S1-14	S1-17	0.25	F
47	JUMPER	–	–	Q	S1-17	S1-18	–	–
48	JUMPER	–	–	R	S1-21	S1-31	–	–
49	JUMPER	–	–	Q	S1-22	S1-23	–	–
50	B-9	4.0	0.25	F	S1-23	S1-28	0.25	F
51	JUMPER	–	–	Q	S1-23	S1-24	–	–
52	B-9	36.0	0.25	F	S1-24	S5-COM	0.25	N
53	JUMPER	–	–	Q	S1-33	S1-34	–	–
54	B-9	4.0	0.25	F	S1-34	S1-37	0.25	F
55	JUMPER	–	–	Q	S1-37	S1-38	–	–
56	B-9	36.0	0.25	F	S1-41	S5-NO	0.25	N
57	JUMPER	–	–	Q	S1-43	S1-44	–	–
58	B-9	4.0	0.25	F	S1-44	S1-48	0.25	F
59	B-9	75.0	0.25	F	S1-51	S3-3	0.25	N
60	C-9	24.0	0.25	F, P	S4-1	L2-BLK	–	–
61	C-9	12.0	0.25	J	TB1-1	CB1-1	0.25	J
62	EMI JUMPER	–	–	G	TB1-1	GND	–	H
63	EMI JUMPER	–	–	G	TB1-2	GND	–	H
64	C-9	15.0	0.25	J	TB1-2	K2-1	0.38	–
65	C-9	13.0	0.25	J	TB1-3	CB1-2	0.25	J
66	B-9	13.0	0.25	G	TB1-3	S1-21	0.25	F
67	B-9	14.0	0.25	G	TB1-3	K2-13	0.38	–

WIRE LISTS – Continued

Table 1. ASH Wire List – Continued.

WIRE ASSY NO.	WIRE TYPE/ COLOR	WIRE LENGTH INCHES (A)	STRIP LENGTH (B)	TERMINAL INDEX (C)	FROM	TO	STRIP LENGTH (D)	TERMINAL INDEX (E)
68	C-9	14.0	0.25	J	TB1-3	K2-3	0.38	–
69	B-9	18.0	0.25	G	TB1-4	S4-2	0.25	F
70	B-9	13.0	0.25	G	TB1-4	S1-22	0.25	F
71	B-9	14.0	0.25	G	TB1-4	K2-A1	0.38	–
72	B-9	9.0	0.25	G	TB1-5	TT	0.25	G
73	B-9	75.0	0.25	G	TB1-5	S2-1	0.25	N
74	B-9	19.0	0.25	G	TB1-6	S7-1	0.25	F
75	B-9	16.0	0.25	G	TB1-6	CB2-2	0.25	N
76	B-9	54.0	0.25	G	TB1-7	C1-2	0.25	P
77	B-9	16.0	0.25	G	TB1-7	B2-BLK	0.25	P
78	B-9	10.0	0.25	G	TB1-7	S1-43	0.25	F
79	B-9	16.0	0.25	G	TB1-7	CB2-1	0.25	N
80	B-9	75.0	0.25	G	TB1-8	S2-3	0.25	N
81	C-9	24.0	0.25	G, P	TB1-8	L1-BLK	–	–
82	B-2	–	0.25	G, O	TB2-1	TR2-RED	–	–
83	JUMPER	–	–	S	TB2-1	TB2-2	–	–
84	B-9	15.0	0.25	K	TB2-2	DS4	0.25	N
85	B-9	14.0	0.25	G	TB2-2	A1-NEG	0.25	F
86	B-9	7.0	0.25	G	TB2-4	K2-A2	0.38	–
87	B-0	24.0	0.25	G, P	TB2-4	L2-BLK	–	–
88	JUMPER	–	–	S	TB2-4	TB2-5	–	–
89	B-9	48.0	0.25	G	TB2-5	C1-1	0.25	P
90	B-9	12.0	0.25	G	TB2-5	B2-WHT	0.25	P
91	JUMPER	–	–	S	TB2-5	TB2-6	–	–
92	B-9	15.0	0.25	G	TB2-6	TT	0.25	G
93	B-9	10.0	0.25	G	TB2-6	DS3	0.25	N
94	JUMPER	–	–	S	TB2-6	TB2-7	–	–
95	B-9	10.0	0.25	G	TB2-7	DS2	0.25	N
96	B-0	24.0	0.25	G, P	TB2-7	L1-BLK	–	–
97	JUMPER	–	–	S	TB2-7	TB2-8	–	–
98	B-0	–	0.25	G, O	TB2-8	TR2-BLK	0.25	–
99	B-9	26.0	0.25	F	TB3-1	D1-YEL	0.25	P
100	B-9	26.0	0.25	F	TB3-2	D1-YEL	0.25	P
101	B-9	75.0	0.25	F	TB3-3	S3-1	0.25	N

WIRE LISTS – Continued

Table 1. ASH Wire List – Continued.

WIRE ASSY NO.	WIRE TYPE/ COLOR	WIRE LENGTH INCHES (A)	STRIP LENGTH (B)	TERMINAL INDEX (C)	FROM	TO	STRIP LENGTH (D)	TERMINAL INDEX (E)
102	B-9	20.0	0.25	F	TB3-4	S1-54	0.25	F
103	B-9	25.0	0.25	F	TB3-7	DS4	0.25	N
104	B-9	24.0	0.25	F	TB3-7	A1-POS	0.25	F
105	B-9	22.0	0.25	F	TB3-7	CO-4	0.25	P
106	B-9	23.0	0.25	F	TB3-8	CB2-4	0.25	N
107	B-9	20.0	0.25	F	TB3-8	S1-61	0.25	F
108	B-9	22.0	0.25	F	TB3-8	CO-5	0.25	P
109	B-9	6.0	0.25	H	TR1-G	GND	0.25	I
110	B-9	11.0	0.25	0.25	TR2-BLK	S1-33	0.25	F, P
111	B-9	15.0	N/A	0.25	TR2-RED	CB2-3	0.25	N, P
112	A-9	–	0.25	F	CO-1	CO1	0.25	N/A
113	A-9	–	0.25	F	CO-2	CO1	0.25	N/A
114	A-0	–	0.25	F	CO-2	CO1	0.25	N/A
115	A-2	–	0.25	F	CO-3	CO1	0.25	N/A
116	B-9	48	0.25	I	TB2-5	C1-1	0.25	N
117	B-9	54	0.25	I	TB1-7	C1-2	0.25	N
118	B-1	–	0.25	N	C1-1	FL1-BRN	0.25	P
119	B-6	–	0.25	N	C1-2	FL1-BLU	0.25	P
120	B-5	–	0.25	J	FL1	G	0.25	J
121	B-1	–	–	–	FL1	TR1	–	–
122	B-1	–	–	–	FL1	TR1	–	–

WIRE LISTS – Continued

Table 2. Remote Control Box Wire List.

WIRE ASSY NO.	WIRE TYPE/ COLOR	WIRE LENGTH INCHES (A)	STRIP LENGTH (B)	TERMINAL INDEX (C)	FROM	TO	STRIP LENGTH (D)	TERMINAL INDEX (E)
1	A-2	6.0	–	–	CO2	TB4-6	0.25	F
2	A-0	6.0	–	–	CO2	TB4-7	0.25	F
3	A-4	6.0	–	–	CO2	TB4-7	0.25	F
4	A-4	6.0	–	–	CO2	TB4-8	0.25	F
5	NOTE 6	8.0	–	–	P3-A	S8-31	0.25	D
6	NOTE 6	8.0	–	–	P3-B	TB4-3	0.25	D
7	NOTE 6	8.0	–	–	P3-C	GND	0.25	D
8	NOTE 6	8.0	–	–	P3-D	S8-11	0.25	D
9	NOTE 6	8.0	–	–	P3-E	TB4-2	0.25	D
10	NOTE 6	8.0	–	–	P3-F	TB4-5	0.25	D
11	NOTE 6	8.0	–	–	P3-G	TB4-1	0.25	D
12	NOTE 6	8.0	–	–	P3-H	S8-34	0.25	D
13	A-2	8.0	–	–	S6-P1	TB4-1	0.25	F
14	A-6	8.0	–	–	S6-P2	TB4-4	0.25	F
15	N/A	12.0	–	–	S6-P4	TP-1	0.25	–
16	N/A	12.0	–	–	S6-P5	TP-1	0.25	–
17	A-4	8.0	–	–	S6-P6	R1-1	0.25	–
18	A-5	8.0	–	–	S6-P7	R1-2	0.25	–
19	A-1	8.0	–	–	S6-P8	R1-3	0.25	–
20	A-2	8.0	–	–	S6-P9	TB4-6	0.25	F
21	A-4	8.0	–	–	S6-P10	TB4-8	0.25	F
22	A-0	8.0	–	–	S6-P11	TB4-7	0.25	F
23	A-9	10.0	–	–	S6-P12	S8-14	0.25	F
24	A-9	8.0	–	–	S6-P13	TB4-2	0.25	F
25	A-3	–	–	–	S6-P14	TB4-5	0.25	F
26	JUMPER	–	–	R	S8-21	S8-31	–	–
27	JUMPER	–	–	Q	S8-22	S8-23	–	–
28	JUMPER	–	–	Q	S8-23	S8-24	–	–
29	JUMPER	–	–	Q	S8-33	S8-34	–	–
30	A-2	8.0	0.25	F	TB4-1	S8-24	0.25	F
31	A-2	8.0	0.25	F	TB4-1	DS6	0.25	N
32	A-6	8.0	0.25	F	TB4-3	DS6	0.25	N
33	A-6	2.0	0.25	F	TB4-3	TB4-4	0.25	F
34	A-3	4.0	0.25	F	TB4-4	DS5	0.25	N

WIRE LISTS – Continued

Table 2. Remote Control Box Wire List - Continued.

WIRE ASSY NO.	WIRE TYPE/ COLOR	WIRE LENGTH INCHES (A)	STRIP LENGTH (B)	TERMINAL INDEX (C)	FROM	TO	STRIP LENGTH (D)	TERMINAL INDEX (E)
35	A-6	6.0	0.25	F	TB4-4	A2-NEG	0.25	F
36	A-3	6.0	0.25	F	TB4-5	A2-POS	0.25	F
37	A-3	4.0	0.25	F	TB4-5	DS5	0.25	N
38	EMI JUMPER	–	–	F	TB4-6	GND	–	G
		–	–	F	TB4-7	GND	–	

END OF WORK PACKAGE

CHAPTER 7

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS FOR ARMY SPACE HEATER H-140

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

ARMY SPACE HEATER H-140

NSN 4520-01-477-0568

REAR PANEL REPAIR

INITIAL SETUP:

Test Equipment
None

Tools and Special Tools
Automotive general mechanic's tool kit (item 10, WP 0058 00)
Drill (item 6, WP 0058 00)
Drill bit (item 6, WP 0058 00)
Rivnut tool (item 3, WP 0058 00)
Rivnut tool (item 4, WP 0058 00)
Welding shop equipment (item 7, WP 0058 00)

Personnel Required
One

References
TC 9-237
TM 43-0139

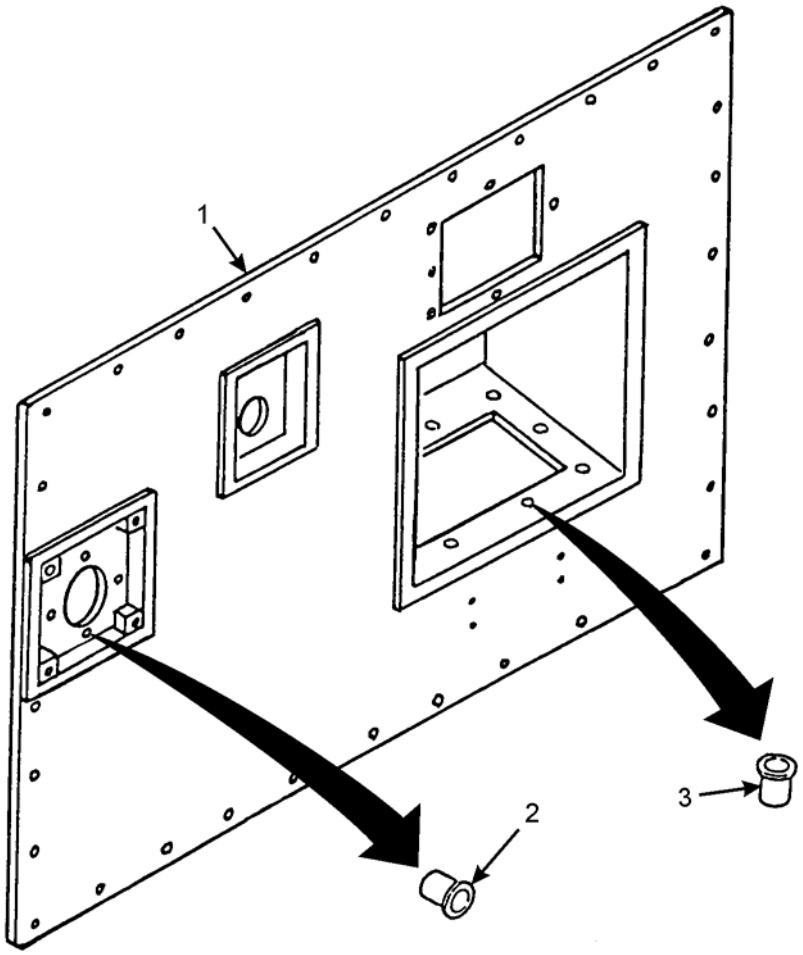
Materials/Parts
Rivnut (item 2, WP 0062 00)
Rivnut (item 13, WP 0062 00)

Equipment Condition
Rear panel assembly removed (WP 0022 00)

REPAIR

1. Inspect rear panel (1) for cracks and welds per TC 9-237.
2. Remove damaged/missing rivnuts (2 and 3) if required as follows:
   a. Drill out four rivnuts (2).
   b. Drill out ten rivnuts (3).
3. Paint rear panel per TM 43-0139.
4. Install rivnuts (3 and 2) if required as follows:
   a. Install ten rivnuts (3) (item 13, WP 0062 00).
   b. Install four rivnuts (2) (item 2, WP 0062 00).

REPAIR – Continued



END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

ARMY SPACE HEATER H-140

NSN 4520-01-477-0568

CONTROL BOX ASSEMBLY
REMOVAL, DISASSEMBLY, INSPECTION, REPAIR, ASSEMBLY, INSTALLATION

INITIAL SETUP:

Test Equipment
None

Tools and Special Tools
Automotive general mechanic's tool kit (item 10, WP 0058 00)
Blind riveter (item 2, WP 0058 00)
Drill (item 6, WP 0058 00)
Drill bit (item 6, WP 0058 00)
Gasket punch (item 6, WP 0058 00)
Shears (item 6, WP 0058 00)

Personnel Required
One

References
None

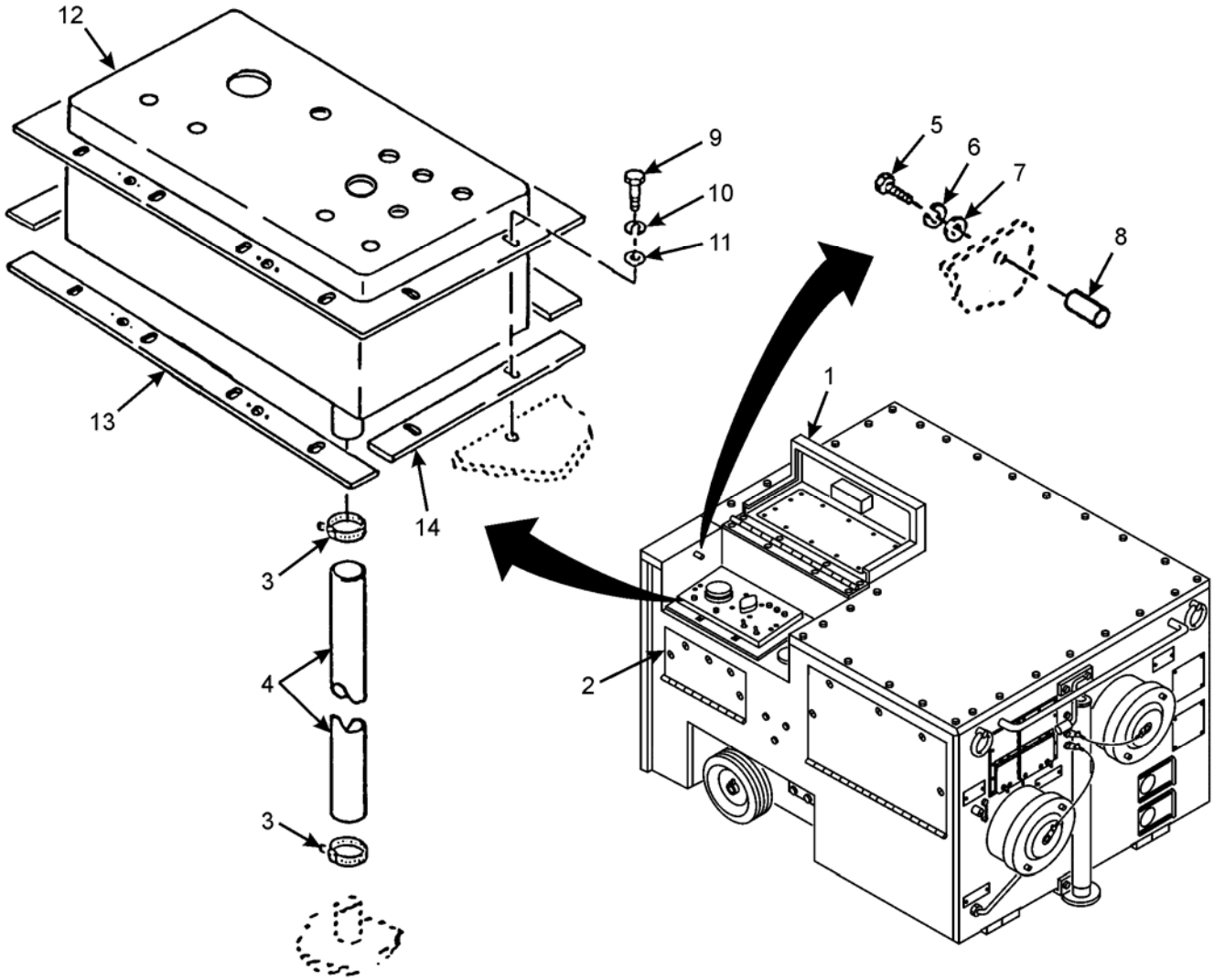
Materials/Parts
Gasket (item 84, WP 0047 00)
Gasket (item 85, WP 0047 00)
Gasket (item 86, WP 0047 00)
Gasket (item 87, WP 0047 00)
Locknut (item 15, WP 0062 00)
Lockwasher (item 28, WP 0062 00)
Rivet (item 4, WP 0062 00)
Rivet (item 6, WP 0062 00)
Rivet (item 8, WP 0062 00)
Sealing compound (item 16, WP 0061 00)

Equipment Condition
ASH disconnected from power source (WP 0005 00)
Electrical control assembly components removed (WP 0026 00)

REMOVAL

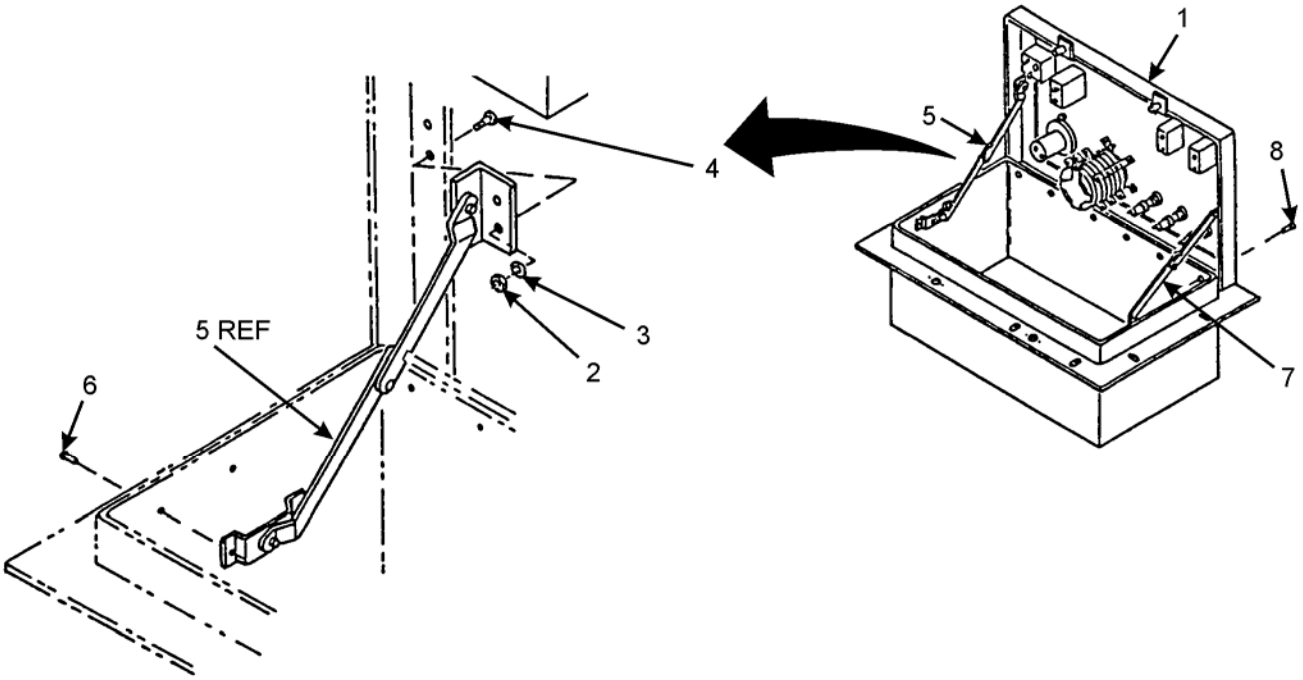
1. Open control box cover (1) and right side rear door (2).
2. Loosen two clamps (3) and remove hose (4) and clamps.
3. Remove screw (5), lockwasher (6), washer (7), and bar (8). Discard lockwasher.
4. Remove 12 screws (9), lockwashers (10), and washers (11). Discard lockwashers.
5. Lift and remove control box assembly (12), two gaskets (13), and two gaskets (14).

REMOVAL – Continued



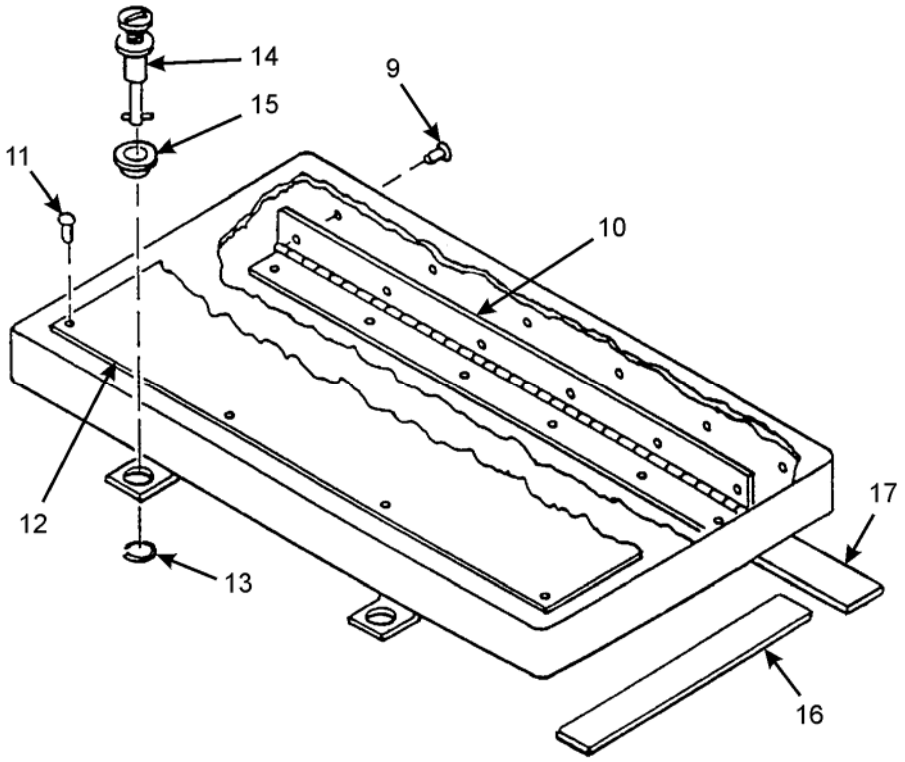
DISASSEMBLY

1. Open control box assembly panel (1).
2. Remove two locknuts (2), washers (3), screws (4), and top end of right support (5).
3. Drill out two rivets (6) and remove bottom end of right support (5).
4. Repeat steps 2 and 3 and remove left support (7).
5. Drill out six rivets (8) and remove control box assembly panel (1).



DISASSEMBLY – Continued

6. Drill out six rivets (9) and remove hinge (10).
7. Drill out eight rivets (11) and remove control panel plate (12).
8. Remove two retaining rings (13), stud assemblies (14), and grommets (15).
9. Remove two gaskets (16) and two gaskets (17).



INSPECTION

1. Inspect all parts for wear, cracks, corrosion, and bent or broken terminals.
2. Inspect all hardware for stripped or damaged threads.

REPAIR

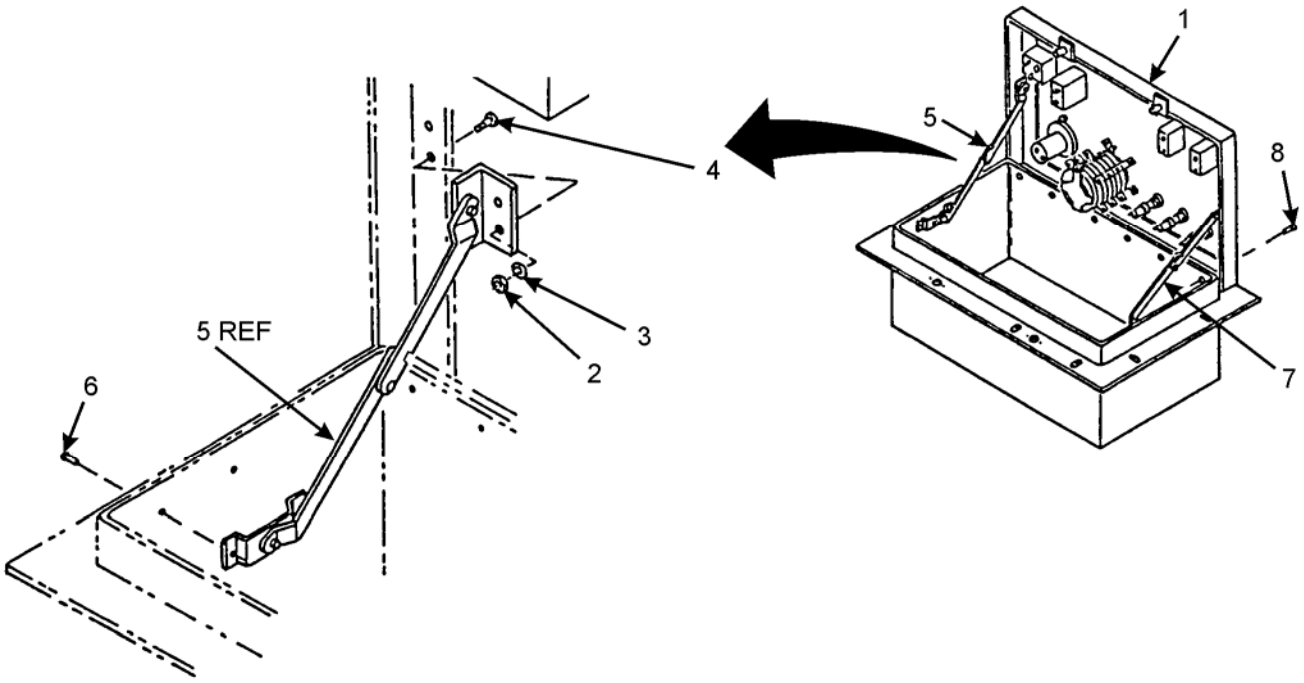
Repair is limited to replacement of defective parts.

ASSEMBLY

1. Install two gaskets (17) (item 87, WP 0047 00) and two gaskets (16) (item 86, WP 0047 00).
2. Install two grommets (15), stud assemblies (14), and retaining rings (13).
3. Install control panel plate (12) with eight rivets (11) (item 4, WP 0062 00).
4. Position hinge (10) and secure with six rivets (9) (item 4, WP 0062 00).

ASSEMBLY – Continued

5. Position control box assembly panel (1) and secure with six rivets (8) (item 6, WP 0062 00).
6. Position bottom end of right support (5) and secure with two rivets (6) (item 8, WP 0062 00).
7. Install top end of right support (5) with two screws (4), washers (3), and locknuts (2).
8. Repeat steps 6 and 7 and install left support (7).



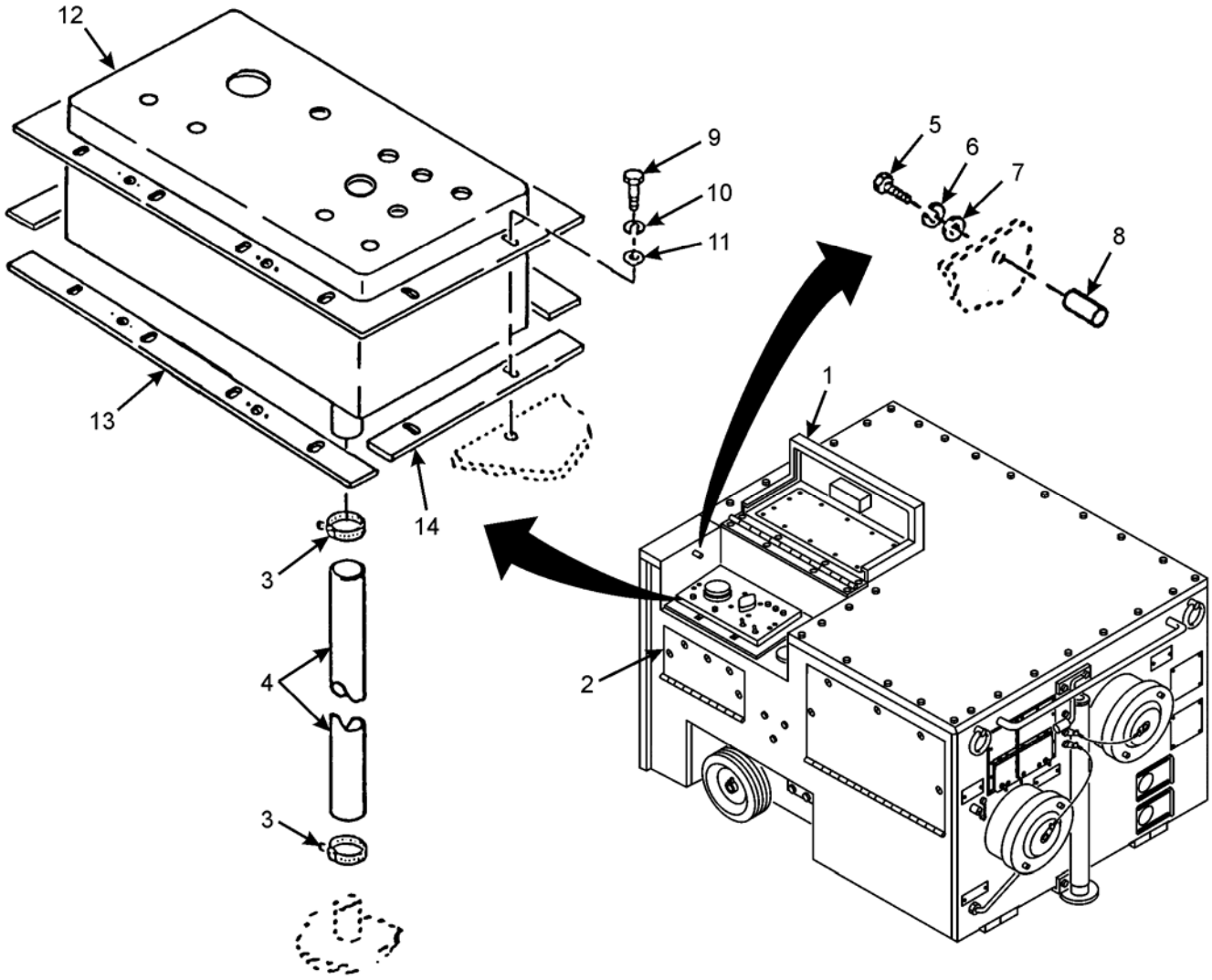
INSTALLATION

1. Install two gaskets (14) (item 84, WP 0047 00) and two gaskets (13) (item 85, WP 0047 00). Trim gaskets as required.
2. Seal edges where gaskets (14 and 13) meet with sealing compound.
3. Install control box assembly (12) with 12 washers (11), lockwashers (10), and screws (9).
4. Install bar (8) with washer (7), lockwasher (6), and screw (5).

NOTE

Hose must be routed under the air inlet of the combustion air fan assembly.

5. Install hose (4) and tighten two clamps (3).
6. Close right side rear door (2) and control box cover (1).



END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

ARMY SPACE HEATER H-140

NSN 4520-01-477-0568

VENTILATION AIR FAN MOTOR AND SCROLL BASE REMOVAL, INSPECTION, REPAIR, INSTALLATION

INITIAL SETUP:

Test Equipment
None

Tools and Special Tools
Automotive general mechanic's tool kit (item 10, WP 0058 00)

Personnel Required
One

References
None

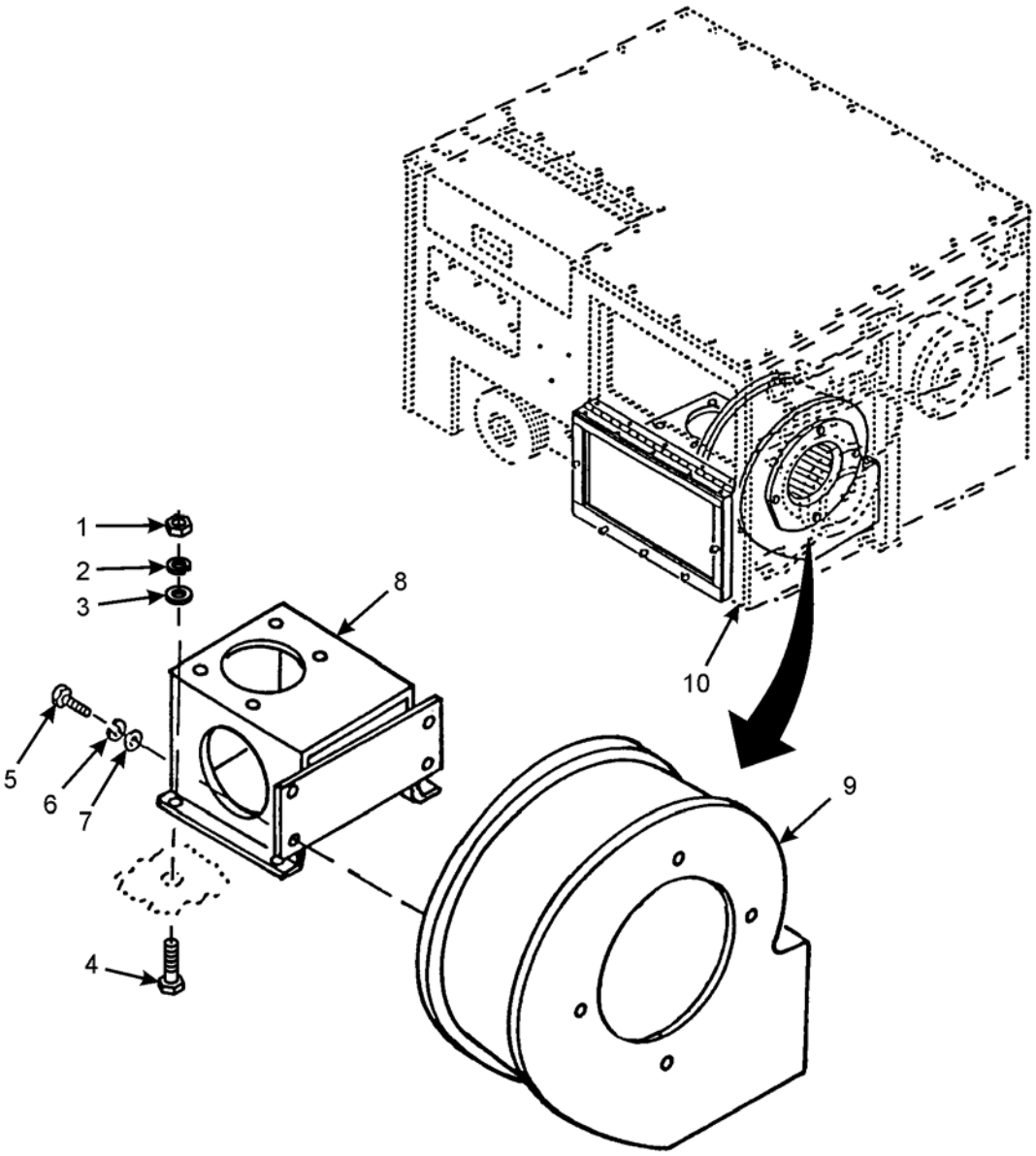
Materials/Parts
Lockwasher (item 28, WP 0062 00)
Lockwasher (item 29, WP 0062 00)

Equipment Condition
ASH disconnected from power source (WP 0005 00)
Fuel pump and solenoid valves removed (WP 0030 00)
Top panel assembly removed (WP 0021 00)
Handbook compartment removed (WP 0045 00)

REMOVAL

1. Remove four nuts (1), lockwashers (2), washers (3), and screws (4).
2. Remove four screws (5), lockwashers (6), and washers (7). Discard lockwashers.
3. Remove base (8) and scroll (9) from cabinet (10).

REMOVAL – Continued



INSPECTION

1. Inspect all parts for wear and cracks.
2. Inspect all hardware for stripped or damaged threads.

REPAIR

Repair is limited to replacement of defective parts.

INSTALLATION

1. Install base (8) and scroll (9) into cabinet (10).
2. Aline scroll (9) with base (8) and secure with four washers (7), lockwashers (6) (item 28, WP 0062 00), and screws (5).
3. Aline base (4) with mounting holes in bottom of cabinet (10).
4. Install four screws (5), washers (3), lockwashers (2) (item 29, WP 0062 00), and nuts (1).

END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

ARMY SPACE HEATER H-140

NSN 4520-01-477-0568

BURNER ASSEMBLY DISASSEMBLY, REPAIR, ASSEMBLY

INITIAL SETUP:

Test Equipment
None

Tools and Special Tools
Automotive general mechanic's tool kit (item 10, WP 0058 00)

Personnel Required
One

References
None

Materials/Parts
Cleaning compound solvent (item 3, WP 0061 00)
General purpose grease (item 11, WP 0061 00)
Lockwasher (item 31, WP 0062 00)
Lockwasher (item 32, WP 0062 00)
O-ring (item 36, WP 0062 00)
O-ring (item 38, WP 0062 00)
Retaining sealing compound (item 19, WP 0061 00)
Sealing compound primer (item 13, WP 0061 00)

Equipment Condition
Burner assembly removed (WP 0036 00)

DISASSEMBLY

CAUTION

Petal valve can be damaged by rough handling. Be careful when disassembling the burner assembly so that the petal valve is not damaged.

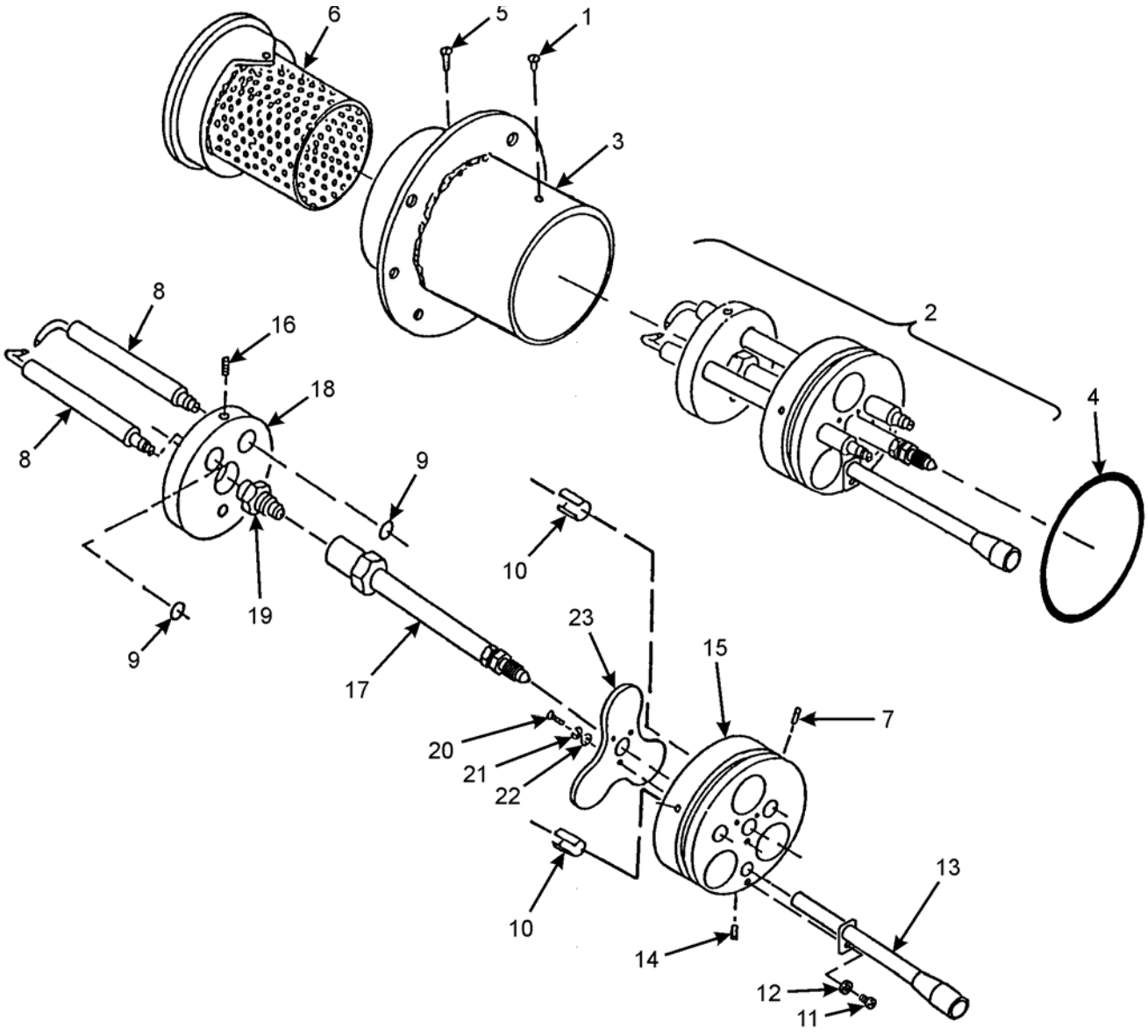
NOTE

When removing the block assembly, the fuel tube, electrodes, and tube assembly will also come out. The O-ring on the block assembly may cause difficulty during removal. If the block assembly is difficult to remove, apply light pressure to the nozzle.

1. Remove three setscrews (1).
2. Remove block assembly (2) from flange (3).
3. Remove O-ring (4).
4. Remove screw (5) and fire ring (6).
5. Remove two setscrews (7), electrodes (8), O-rings (9), and sleeves (10).
6. Remove screw (11), lockwasher (12), and tube assembly (13). Discard lockwasher.

DISASSEMBLY – Continued

7. Remove setscrew (14) from block (15).
8. Remove setscrew (16) and fuel tube (17) from baffle (18).
9. Remove nozzle (19) from fuel tube (17).
10. Remove three screws (20), lockwashers (21), washers (22), and petal valve (23). Discard lockwashers.



REPAIR

Repair is limited to replacement of defective parts.

ASSEMBLY

CAUTION

Petal valve can be damaged by rough handling. Be careful when assembling the burner assembly so that the petal valve is not damaged.

NOTE

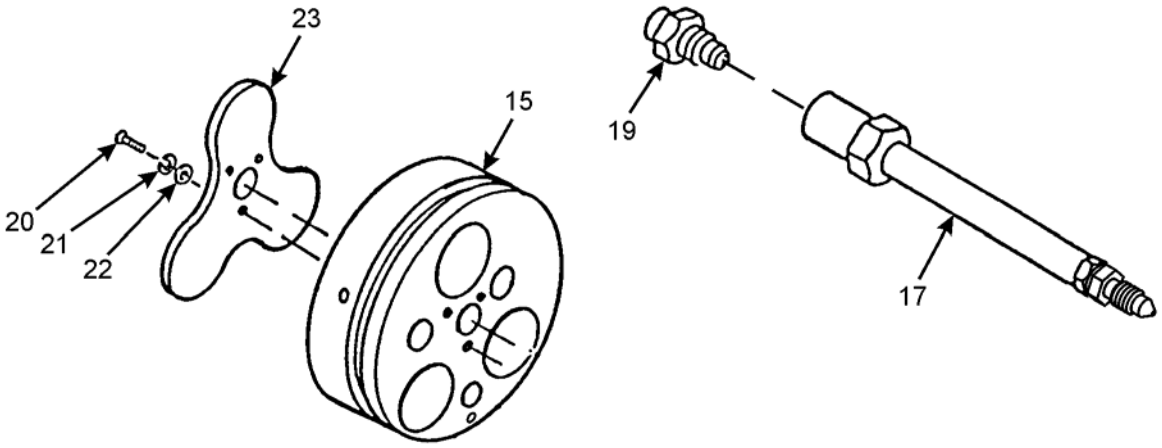
Front of the block assembly is the flat face furthest from the packing groove. Packing groove is toward the back face of the block.

1. Install petal valve (23), three washers (22), lockwashers (21) (item 31, WP 0062 00), and screws (20) onto front of block (15).

CAUTION

Do not overtighten the nozzle. Damage to the fuel tube may result.

2. Install nozzle (19) onto fuel tube (17). Torque nozzle to 25 to 40 lb-in. (3 to 4 Nm).



ASSEMBLY – Continued

3. Install fuel tube (17) into baffle (18) until baffle contacts hex nut on fuel tube.

4. Secure fuel tube (17) to baffle (18) with setscrew (16).

5. Install two sleeves (10) into block (15) 0.10 to 0.16 inch (0.25 to 0.41 cm) from outer surface of block. Ensure that slots are 180 degrees (3200 mils) away from two setscrews (7).

6. Install two electrodes (8), O-rings (9) (item 38, WP 0062 00) to aline baffle (18), and block (15).

NOTE

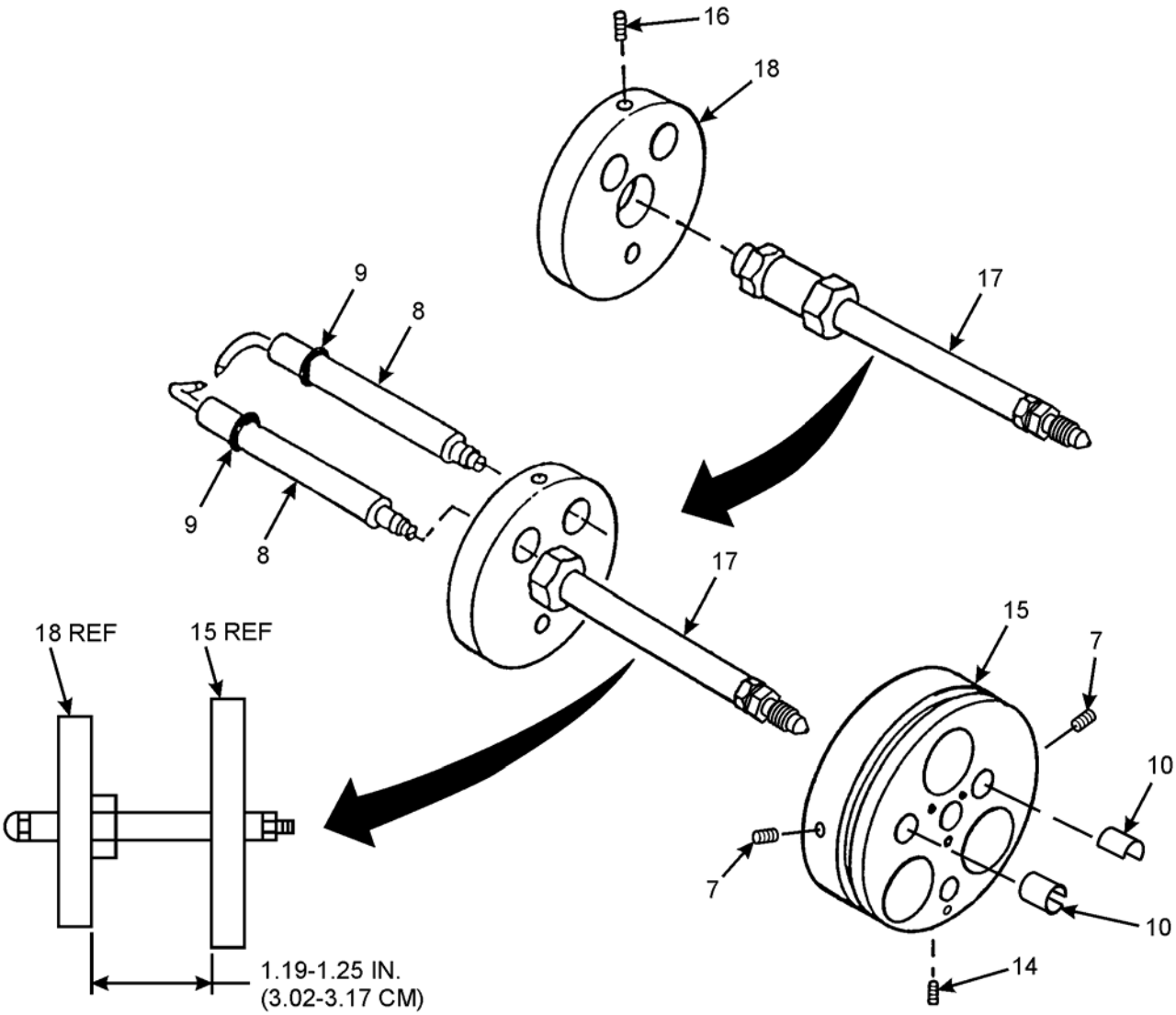
Distance between the front of the block and the back of the baffle is 1.19 to 1.25 inches (3.02 to 3.17 cm).

7. Install fuel tube (17) through center hole in front of block (15).

8. Secure fuel tube (17) into block (15) with setscrew (14). Torque setscrew to 10 to 15 lb-in. (1.1 to 1.6 Nm).

9. Remove two electrodes (8) and O-rings (9).

ASSEMBLY – Continued



ASSEMBLY – Continued

10. Install two O-rings (9) (item 38, WP 0062 00) onto two electrodes (8) toward tips.

WARNING

Cleaning compound solvent vapors are toxic. Avoid prolonged or repeated breathing of vapors or solvent contact with skin. Use only with adequate ventilation. Solvent is flammable and should not be used near open flame. Be sure a fire extinguisher is available.

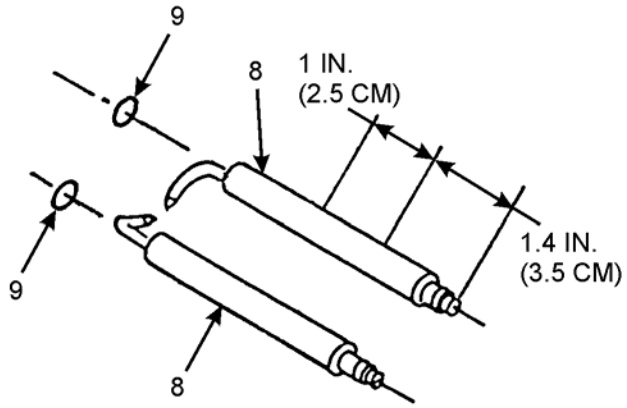
11. Clean white porcelain on two electrodes (8) with cleaning compound solvent.

12. Measure approximately 1.4 inch (3.5 cm) from connector end of two electrodes (8) and treat next 1 inch (2.5 cm) of porcelain with sealing compound primer.

NOTE

Only areas treated with the sealing compound primer should have retaining sealing compound applied.

13. Apply two drops of retaining sealing compound onto two electrodes (8) and spread over treated area.



ASSEMBLY – Continued

14. Insert two electrodes (8) into baffle (18) and block (15). Ensure that O-rings (9) (items 38, WP 0062 00) are inserted into baffle 0.12 to 0.18 inch (0.31 to 0.46 cm) from outer surface of baffle.

15. Install two setscrews (7). Do not tighten.

16. Position tips of two electrodes (8) 0.25 to 0.31 inch (0.64 to 0.79 cm) in front of nozzle (19) and 0.35 to 0.41 inch (0.89 to 1.04 cm) above nozzle discharge port (View A).

17. Torque two setscrews (7) to 10 to 15 lb-in. (1.1 to 1.6 Nm).

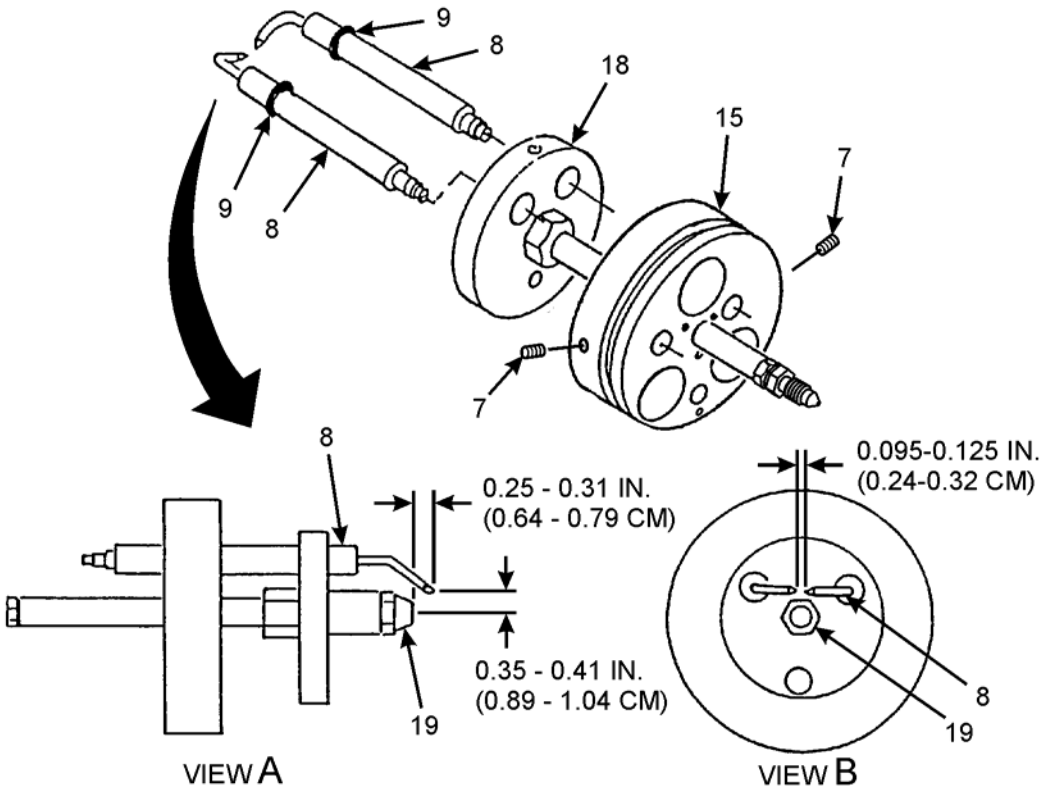
CAUTION

Use care when bending electrode tips or damage may result.

18. Carefully bend tips of two electrodes (8) to adjust gap to 0.095 to 0.125 inch (0.24 to 0.32 cm) (View B).

19. Check position of two electrodes (8). Repeat steps 17 thru 19 as required.

20. Ensure that position of two O-rings (9) is 0.12 to 0.18 inch (0.31 to 0.45 cm) from nozzle (19) side of baffle (18).



ASSEMBLY – Continued

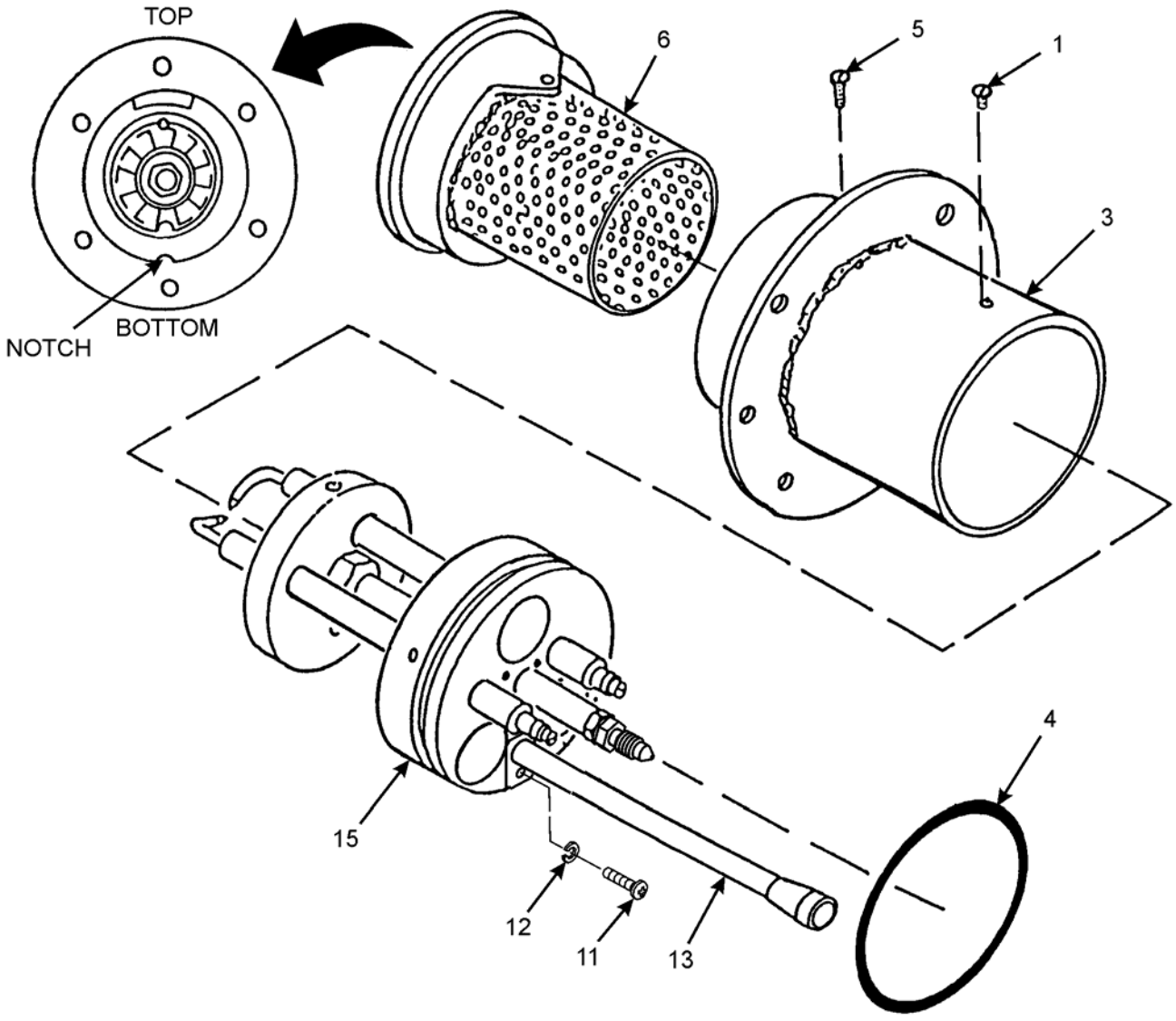
21. Apply general purpose grease to flange (3) and O-ring (4) (item 36, WP 0062 00).

22. Install O-ring (4) (item 35, WP 0062 00) onto block (15).

23. Install tube assembly (13) with lockwasher (12) (item 32, WP 0062 00) and screw (11).

24. Install fire ring (6) into flange (3) with screw (5).

25. Install block (15) flush with flange (3), alining tube assembly (13) with notch in fire ring (6), and secure with three setscrews (1). Torque three setscrews to 10 to 15 lb-in. (1.1 to 1.6 Nm).



END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

ARMY SPACE HEATER H-140

NSN 4520-01-477-0568

HEAT EXCHANGER ASSEMBLY
REMOVAL, DISASSEMBLY, INSPECTION, REPAIR, ASSEMBLY, INSTALLATION

INITIAL SETUP:

Test Equipment
None

Tools and Special Tools
Automotive general mechanic's tool kit (item 10, WP 0058 00)
Gloves (item 6, WP 0058 00)

Personnel Required
Two

References
WP 0022 00

Materials/Parts
Lockwasher (item 28, WP 0062 00)

Equipment Condition
ASH disconnected from power source (WP 0005 00)
Burner assembly removed (WP 0036 00)
Control box cover assembly removed (WP 0020 00)
Ignition transformer assembly removed (WP 0035 00)
Jack assembly removed (WP 0042 00)
Supply duct air screen removed (WP 0025 00)
Supply duct cover assembly removed (WP 0024 00)
Top panel assembly removed (WP 0021 00)

REMOVAL

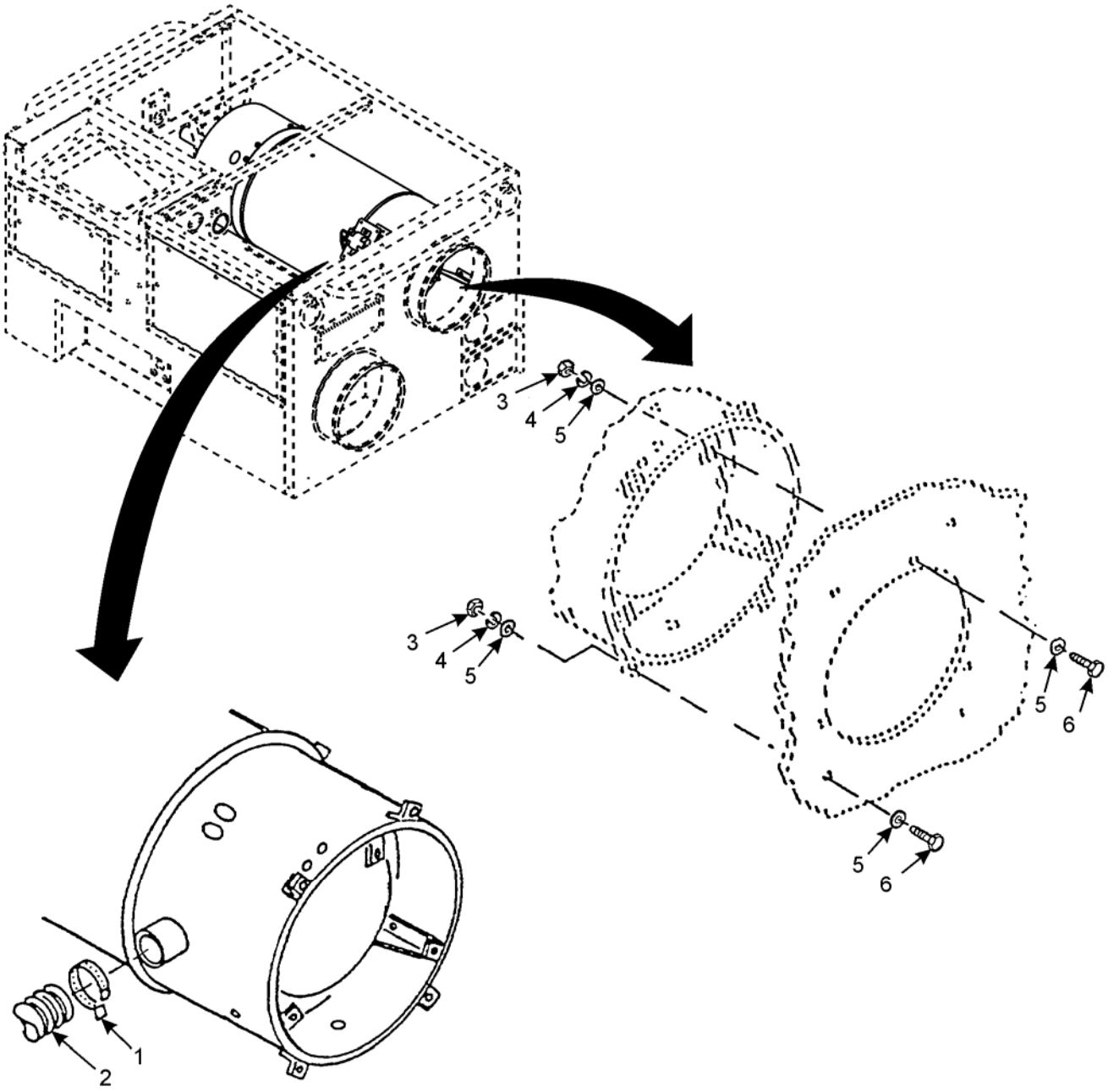
1. Loosen clamp (1) and disconnect hose (2).

CAUTION

Do not remove attaching hardware from two top locations.

2. Remove 5 nuts (3), 5 lockwashers (4), 14 washers (5), and 5 screws (6). Discard lockwashers.

REMOVAL – Continued



REMOVAL – Continued

3. Remove three nuts (7), three lockwashers (8), six washers (9), and three screws (10). Discard lockwashers.

4. Remove three nuts (11), three lockwashers (12), six washers (13), three screws (14), and three each brackets (15 and 16). Discard lockwashers.

3. Remove two nuts (17), two lockwashers (18), four washers (19), two screws (20), and support (21). Discard lockwashers.

4. Refer to WP 0022 00 and perform Removal steps 1 thru 5 and 7, except do not remove two lower corner screws referenced in step 7.

5. Remove screw (22), lockwasher (23), and washer (24). Discard lockwasher.

6. Remove three nuts (25), three lockwashers (26), six washers (27), three screws (28), and support (29). Discard lockwashers.

WARNING

Edges of sheet metal can be sharp and cause injury to personnel. Gloves are required when handling the heat exchanger assembly.

CAUTION

Support the heat exchanger assembly when removing the last support screw or damage to the assembly will result. Support the front and rear of the assembly prior to final removal of attaching hardware.

NOTE

Two people are required to remove the heat exchanger assembly.

9. Support front end of heat exchanger assembly (30) and remove two remaining nuts (3), two lockwashers (4), four washers (5), and two screws (6) referenced in step 2 above. Discard lockwashers.

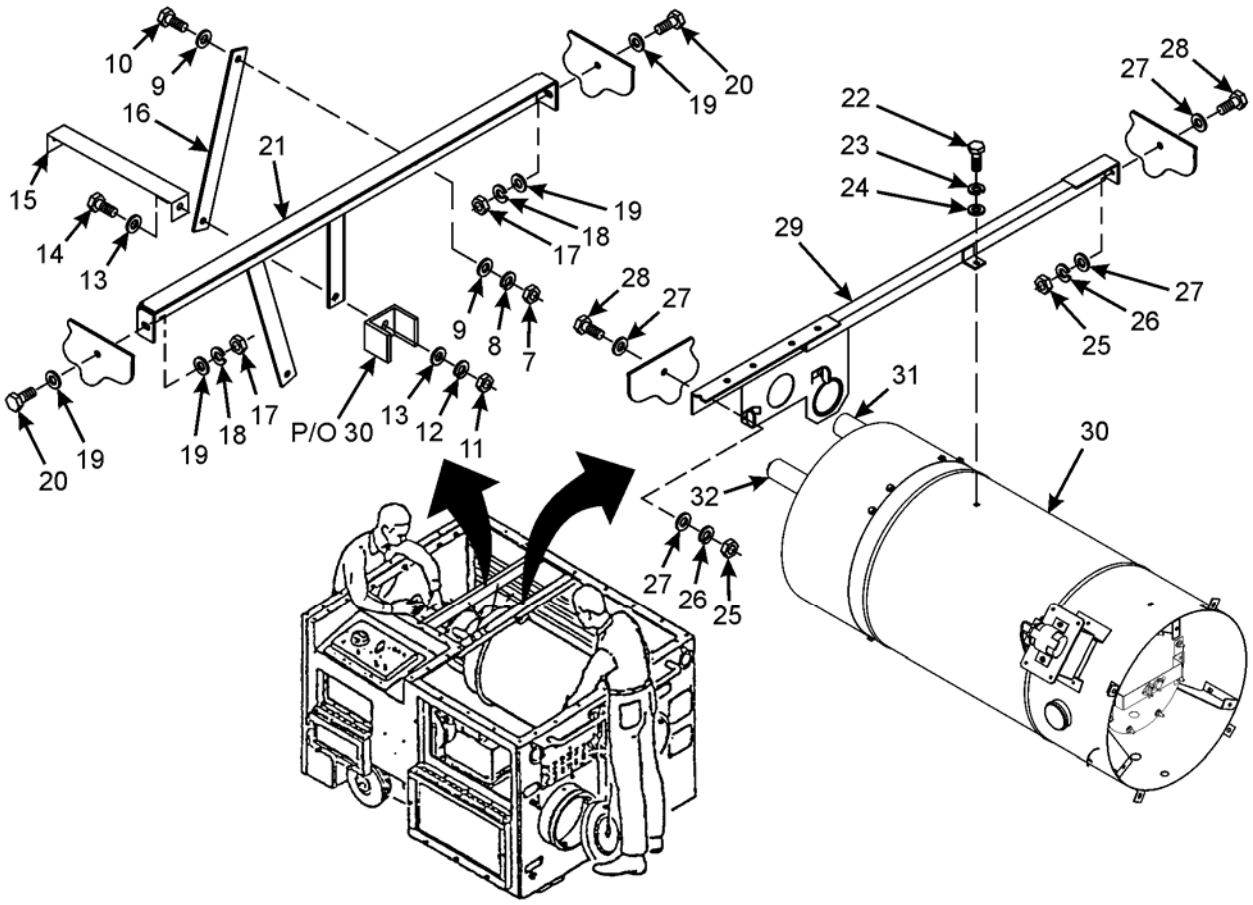
10. Gently flex rear panel assembly outward and simultaneously slide heat exchanger assembly (30) back until it is clear of front edge of frame.

CAUTION

Use care when removing the heat exchanger assembly to avoid damage to the exhaust pipe (31) and sight tube (32).

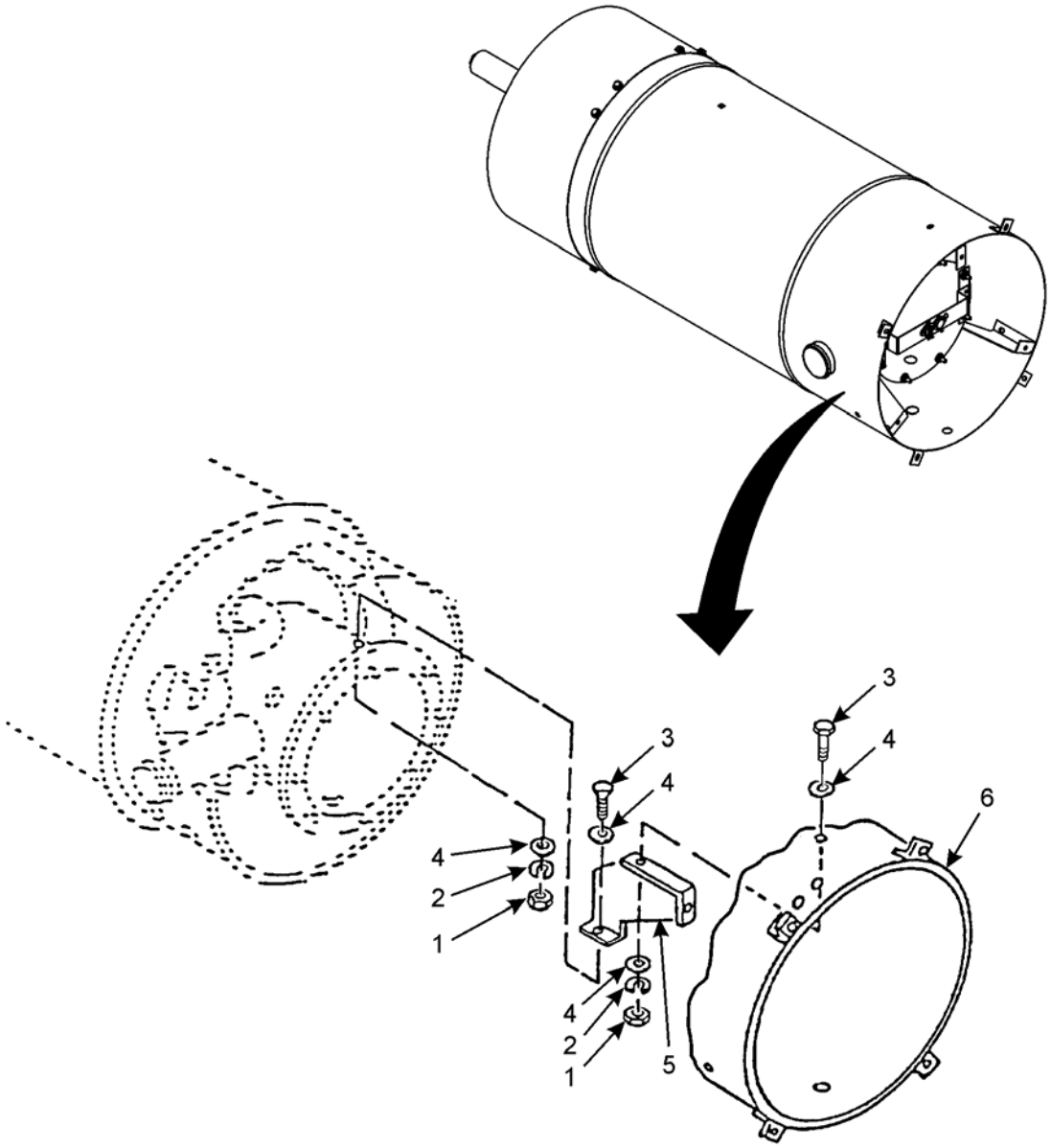
11. Carefully lift front of heat exchanger assembly (30) until it is clear of front edge of frame and remove heat exchanger assembly.

REMOVAL – Continued



DISASSEMBLY

1. Remove six nuts (1), lockwashers (2), screws (3), and 12 washers (4) from three brackets (5). Discard lockwashers.
2. Remove three brackets (5) from heat exchanger assembly shell (6).



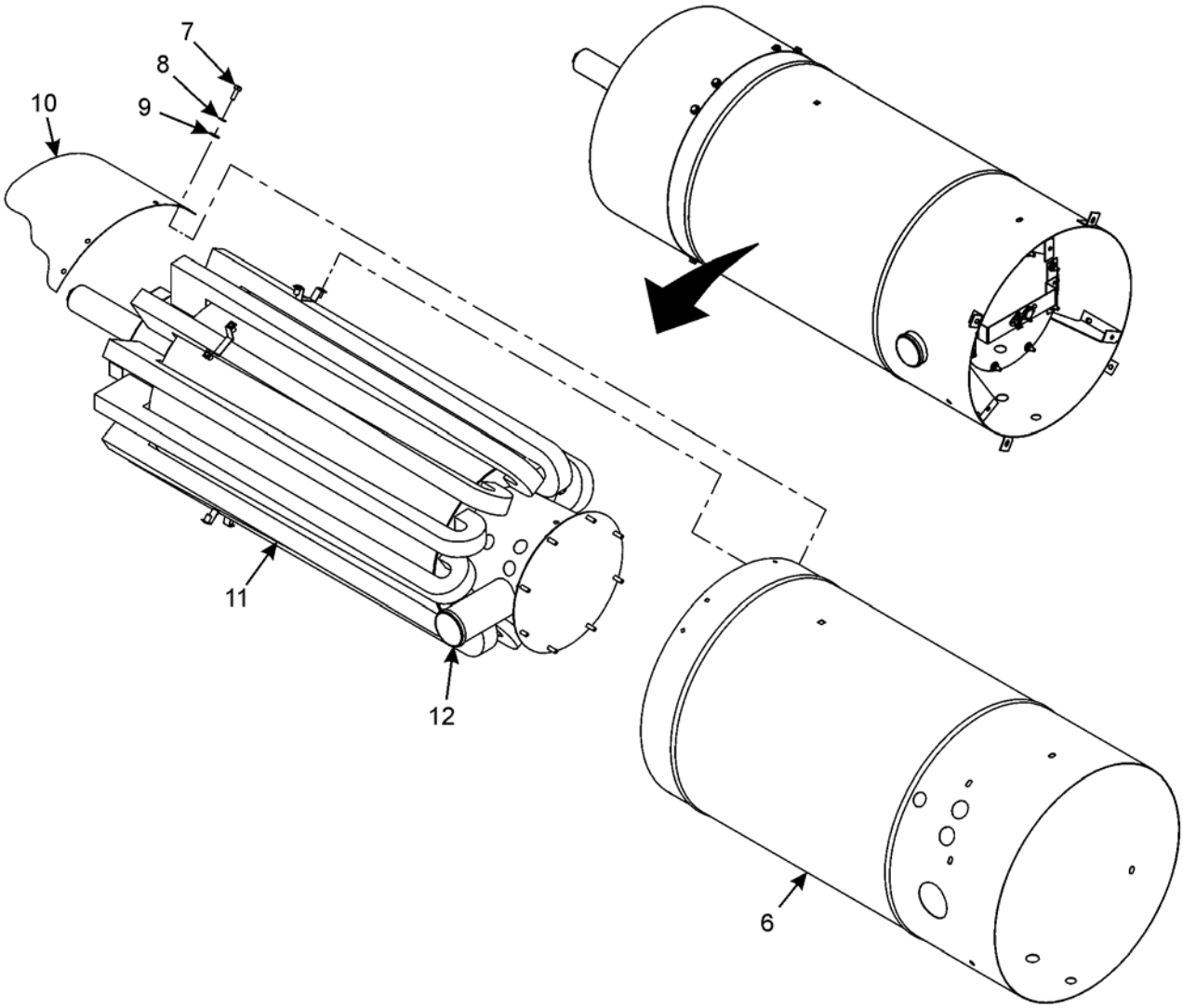
DISASSEMBLY – Continued

3. Remove eight screws (7), lockwashers (8), washers (9), and shell extension (10). Discard lockwashers.

NOTE

Heat exchanger assembly shell must be tilted to allow clearance for the heat exchanger assembly air inlet pipe.

4. Remove heat exchanger assembly shell (6) from heat exchanger assembly (11) being careful of air inlet pipe (12).



INSPECTION

1. Inspect all parts for wear, cracks, and corrosion.

2. Inspect all hardware for stripped or damaged threads.

REPAIR

Repair is limited to replacement of defective parts.

ASSEMBLY

WARNING

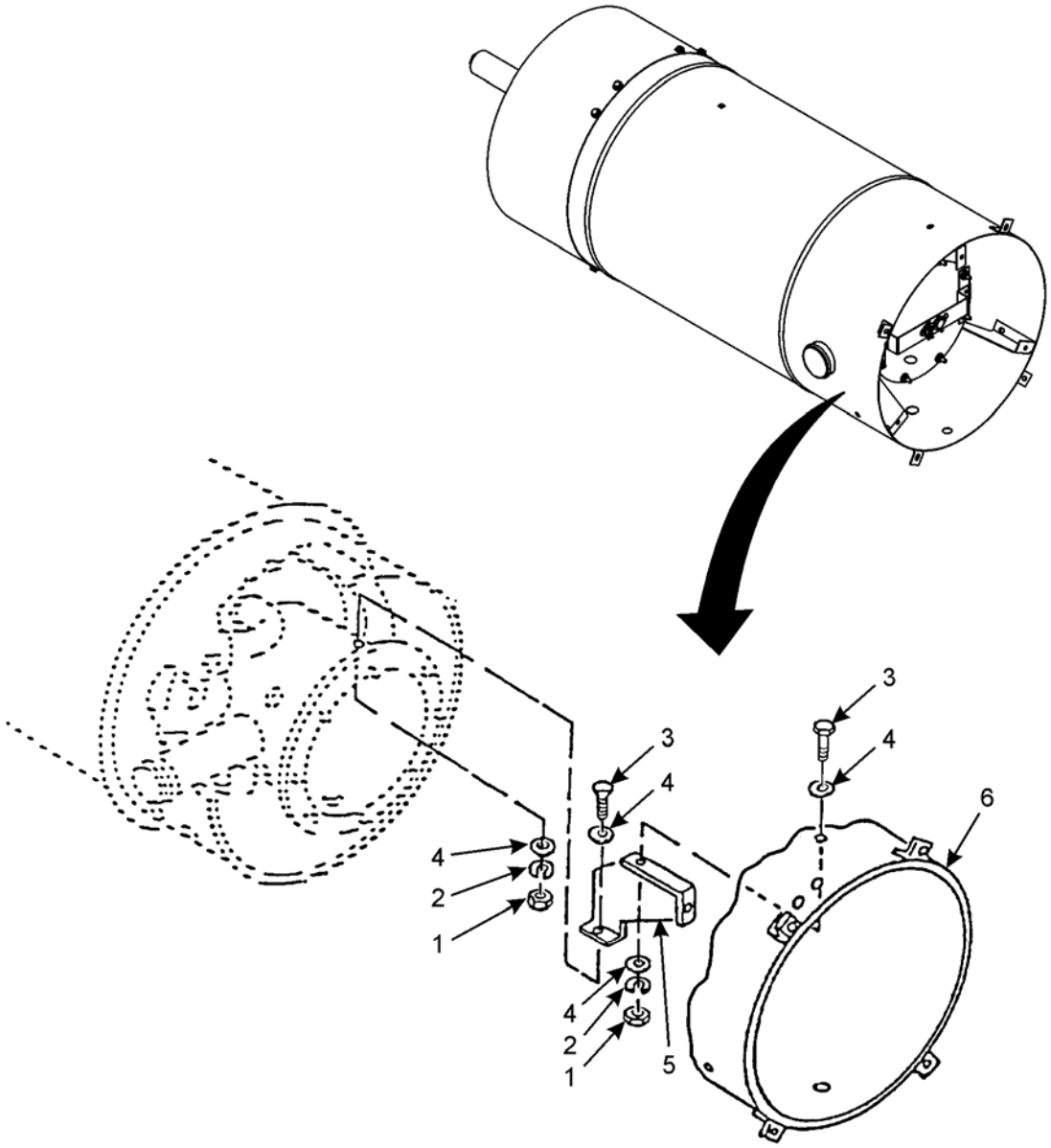
Edges of sheet metal can be sharp and cause injury to personnel. Gloves are required when handling the heat exchanger assembly.

1. Slide heat exchanger assembly shell (6) onto heat exchanger assembly (11) with air inlet pipe (12) alined with large opening in side of shell.

2. Install shell extension (10), eight washers (9), lockwashers (8), and screws (7).

3. Install three brackets (5) on heat exchanger assembly shell (6) with 12 washers (4), six screws (3), lockwashers (2), and nuts (1).

ASSEMBLY – Continued



INSTALLATION

WARNING

Edges of sheet metal can be sharp and cause injury to personnel. Gloves are required when handling the heat exchanger assembly.

NOTE

Two people are required to install the heat exchanger assembly.

1. Install heat exchanger assembly (30) through top of ASH, flex rear panel outward, and engage sight tube (32) and exhaust pipe (31) into rear panel assembly.

2. Gently position heat exchanger assembly (30) and rear panel assembly and guide heat exchanger forward against front mounting location. Support front of heat exchanger assembly (30) and aline mounting holes and install two screws (6), four washers (5), two lockwashers (4), and two nuts (3).

3. Install support (29) with three screws (28), six washers (27), three lockwashers (26), and three nuts (25).

4. Install washer (24), lockwasher (23), and screw (22).

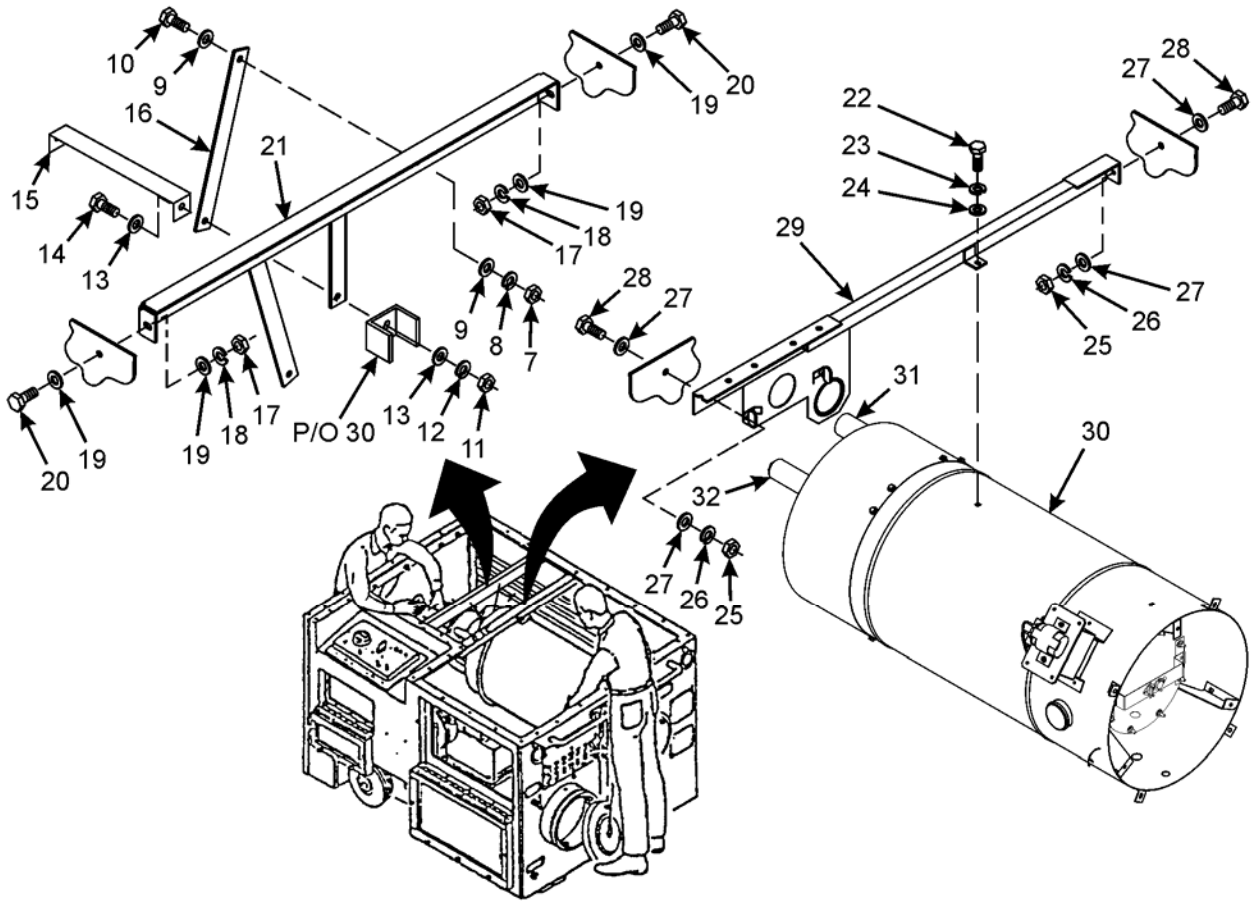
5. Install support (21), two screws (20), four washers (19), two lockwashers (18), and two nuts (17).

6. Refer to WP 0022 00 and perform Installation steps 1 thru 3 and 5.

7. Install three each brackets (16 and 15), three screws (14), six washers (13), three lockwashers (12), and three nuts (11). Handtighten only.

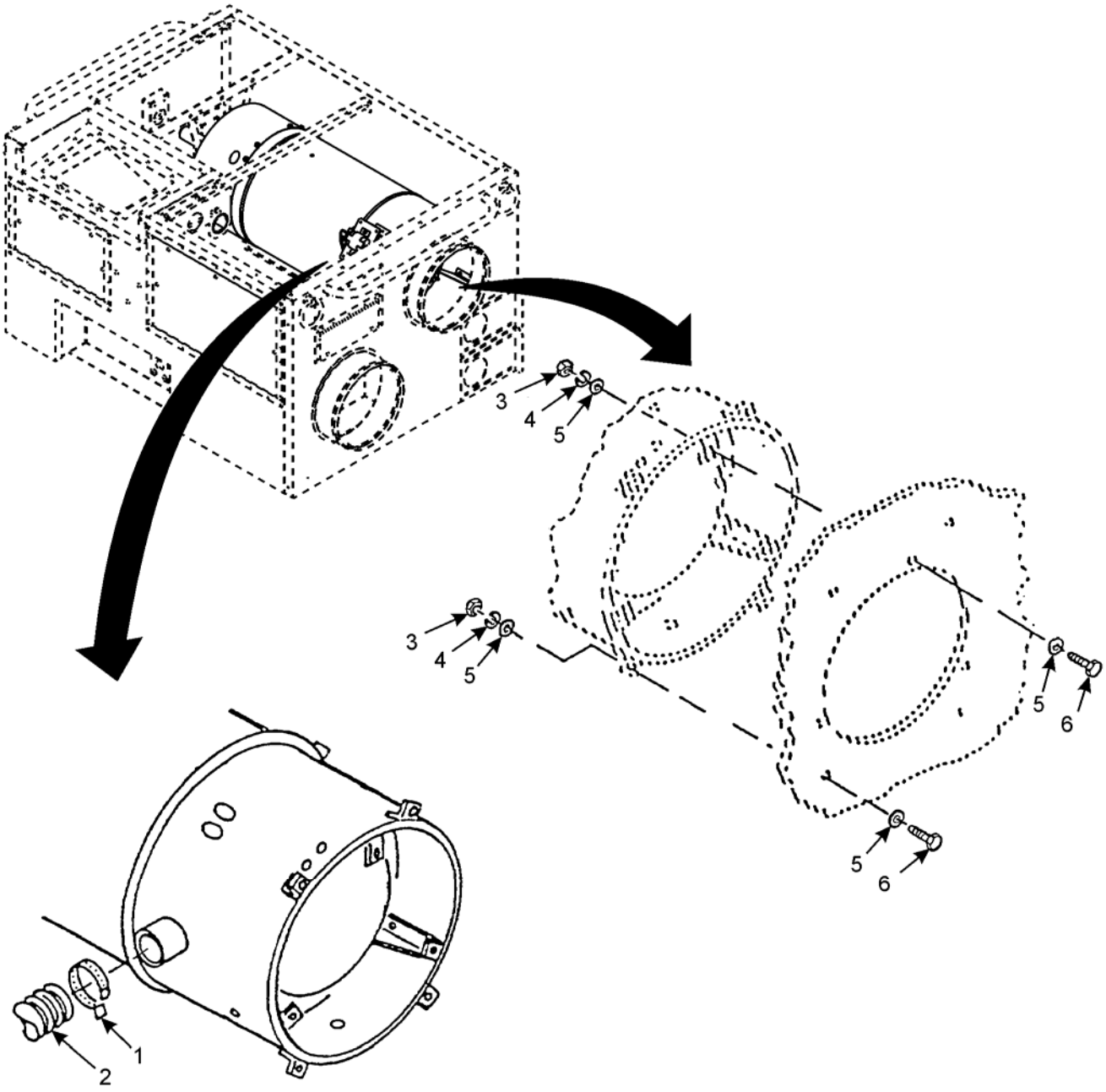
8. Install three screws (10), six washers (9), three lockwashers (8), and three nuts (7). Handtighten only.

INSTALLATION – Continued



INSTALLATION – Continued

8. Aline front mounting holes and install 5 screws (6), 14 washers (5), 5 lockwashers (4), and 5 nuts (3).
9. Tighten all hardware installed in steps 7 and 8 above.
10. Connect hose (2) and tighten clamp (1).
11. Tighten all hardware installed during assembly procedure.



END OF WORK PACKAGE

DIRECT SUPPORT MAINTENANCE INSTRUCTIONS

ARMY SPACE HEATER H-140

NSN 4520-01-477-0568

FRAME ASSEMBLY DISASSEMBLY, ASSEMBLY

INITIAL SETUP:

Test Equipment
None

Tools and Special Tools
Automotive general mechanic's tool kit (item 10, WP 0058 00)
Blind riveter (item 2, WP 0058 00)
Common no. 1 shop equipment (item 6, WP 0058 00)
Drill (item 6, WP 0058 00)
Drill bit (item 6, WP 0058 00)
General mechanic's tool kit (item 9, WP 0058 00)
Rivnut tool (item 3, WP 0058 00)
Rivnut tool (item 5, WP 0058 00)
Welding shop equipment (item 7, WP 0058 00)

Personnel Required
One

References
WP 0047 00, table 1

Materials/Parts
Gasket (item 39, WP 0062 00)
Grommet (item 1, WP 0047 00)
Insulation (item 3, WP 0047 00)
Insulation (item 4, WP 0047 00)
Insulation (item 5, WP 0047 00)
Insulation (item 6, WP 0047 00)
Insulation (item 7, WP 0047 00)
Insulation (item 8, WP 0047 00)
Insulation (item 9, WP 0047 00)
Insulation (item 10, WP 0047 00)
Insulation (item 11, WP 0047 00)
Insulation (item 12, WP 0047 00)
Insulation (item 13, WP 0047 00)
Insulation (item 14, WP 0047 00)
Insulation (item 15, WP 0047 00)
Insulation (item 17, WP 0047 00)
Insulation (item 18, WP 0047 00)
Insulation (item 19, WP 0047 00)
Insulation (item 21, WP 0047 00)

Materials/Parts – Continued
Insulation (item 22, WP 0047 00)
Insulation (item 23, WP 0047 00)
Insulation (item 24, WP 0047 00)
Insulation (item 25, WP 0047 00)
Insulation (item 26, WP 0047 00)
Insulation (item 27, WP 0047 00)
Insulation (item 31, WP 0047 00)
Insulation (item 33, WP 0047 00)
Insulation (item 34, WP 0047 00)
Insulation (item 35, WP 0047 00)
Insulation (item 37, WP 0047 00)
Insulation (item 38, WP 0047 00)
Insulation (item 42, WP 0047 00)
Lockwasher (item 28, WP 0062 00)
Lockwasher (item 29, WP 0062 00)
Rivet (item 10, WP 0062 00)
Rivnut (item 1, WP 0062 00)
Rivnut (item 12, WP 0062 00)
Rivnut (item 13, WP 0062 00)
Rivnut (item 38, WP 0062 00)
Rubber adhesive (item 1, WP 0061 00
Sealing compound (item 16, WP 0061 00)

Equipment Condition
Air pressure switch removed (WP 0028 00)
Burner assembly removed (WP 0036 00)
Cabinet assembly disassembled (WP 0045 00)
Combustion air fan assembly removed (WP 0033 00)
Control box cover assembly removed (WP 0020 00)
Electrical control assembly components removed (WP 0026 00)
Exhaust pipe and elbow removed (WP 0018 00)
Fresh air damper assembly removed (WP 0044 00)
Fuel filter removed (WP 0031 00)
Fuel pressure gage removed (WP 0027 00)
Fuel pump and solenoid valves removed (WP 0030 00)
Fuel tank assembly removed (WP 0029 00)

INITIAL SETUP – Continued:

Equipment Condition – Continued
- Heat exchanger assembly removed (WP 0037 00)
- Ignition transformer assembly removed (WP 0035 00)
- Jack assembly removed (WP 0042 00)
- Power cable assembly removed (WP 0039 00)
- Rear panel assembly removed (WP 0022 00)
- Remote control box removed (WP 0038 00)
- Side rear door and side front door assemblies removed (WP 0023 00)
- Supply and return air hose assemblies removed (WP 0019 00)

Equipment Condition – Continued
- Supply and return duct air screens removed (WP 0025 00)
- Supply and return duct cover assemblies removed (WP 0024 00)
- Thermostat assembly removed (WP 0034 00)
- Top panel assembly removed (WP 0021 00)
- Ventilation air fan and motor assembly removed (WP 0032 00)
- Wheel assemblies removed (WP 0043 00)

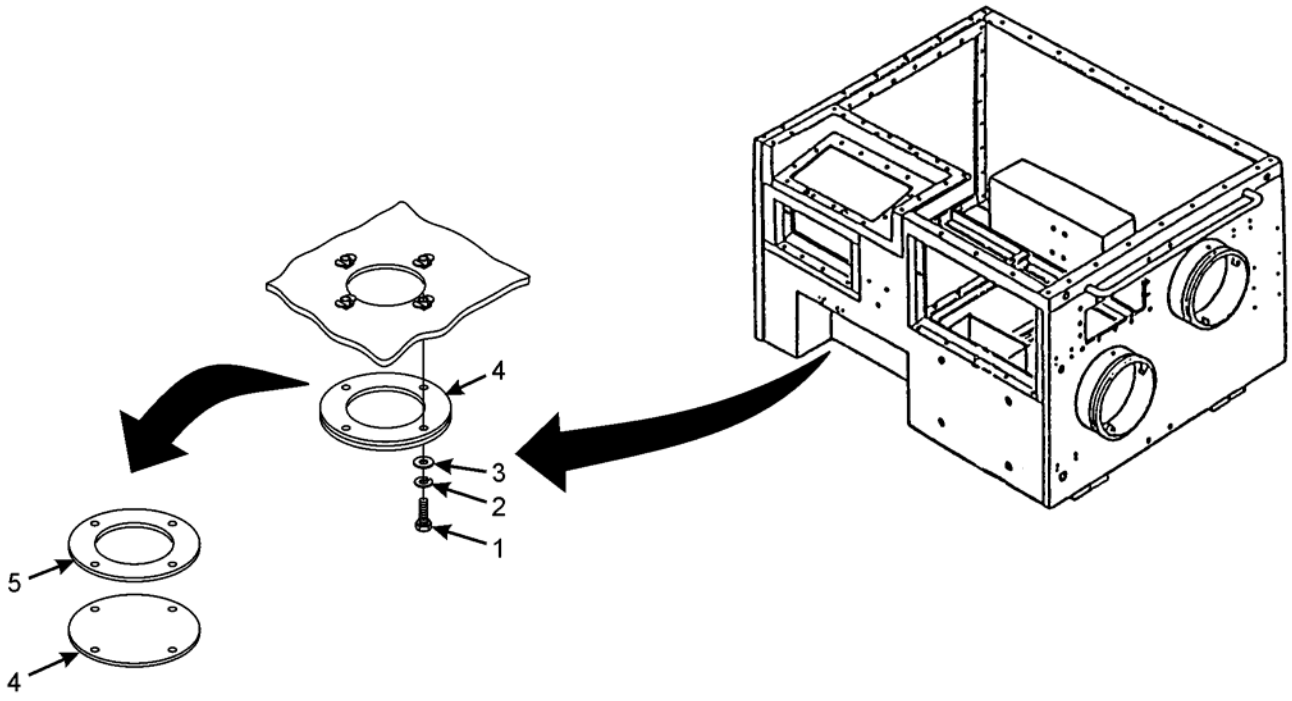
DISASSEMBLY

NOTE

Insulation should only be removed when necessary to gain access to another part/component or when replacement is necessary.

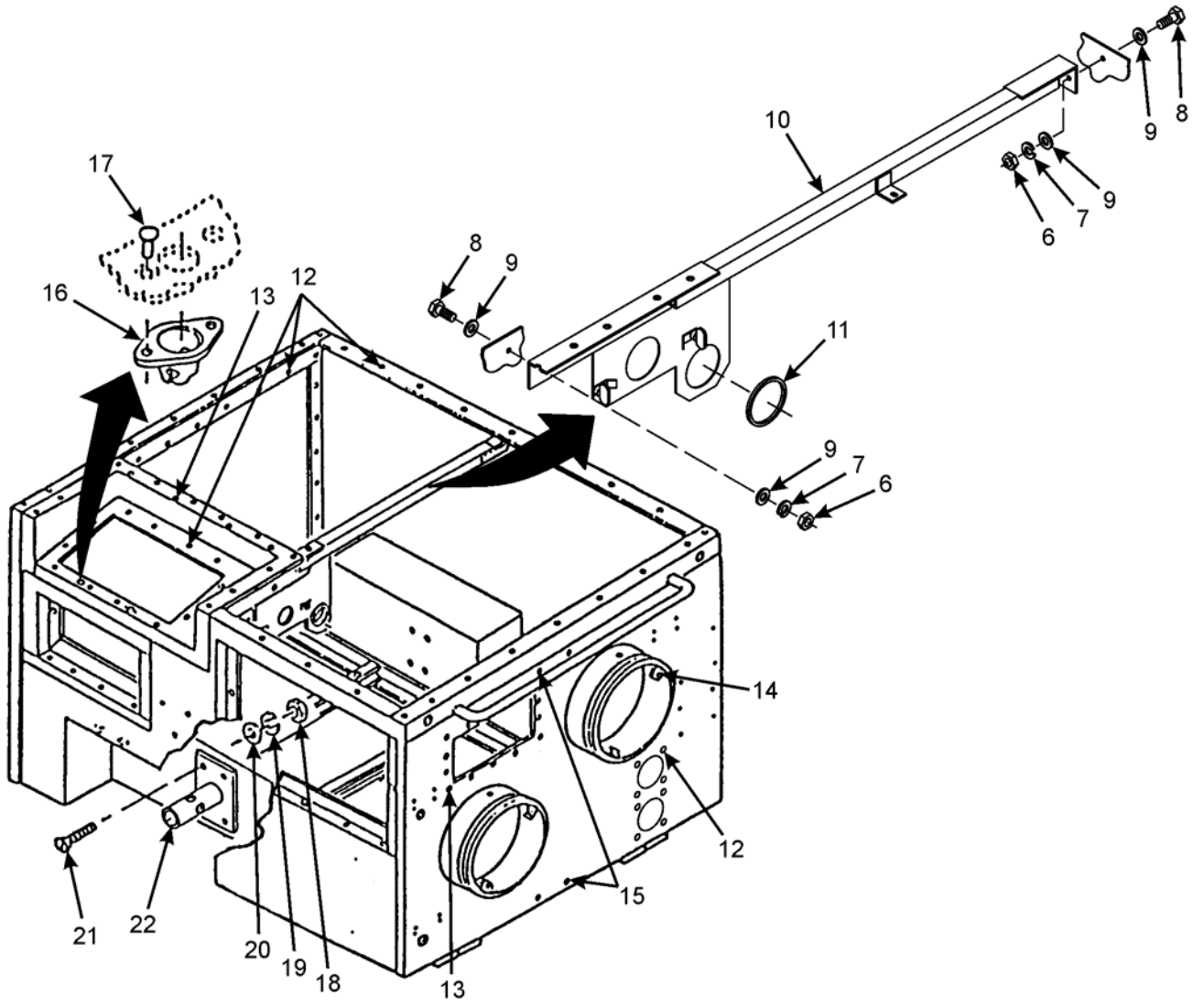
1. Remove four screws (1), lockwashers (2), washers (3), and fuel drain cover (4). Discard lockwashers.

2. Remove gasket (5) from fuel drain cover (4).



DISASSEMBLY – Continued

1. Remove two nuts (6), lockwashers (7), screws (8), four washers (9), and support (10). Discard lockwashers.
2. Remove grommet (11). Discard grommet.
3. Drill out rivnuts (12 thru 15) as required.
4. Remove each receptacle (16) as required by drilling out two rivets (17).
5. Remove four nuts (18), lockwashers (19), washers (20), screws (21), and wheel pivot (22). Discard lockwashers.

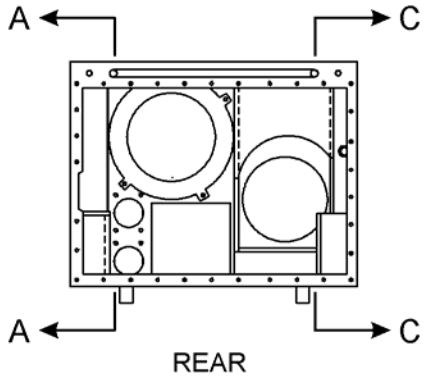


DISASSEMBLY – Continued

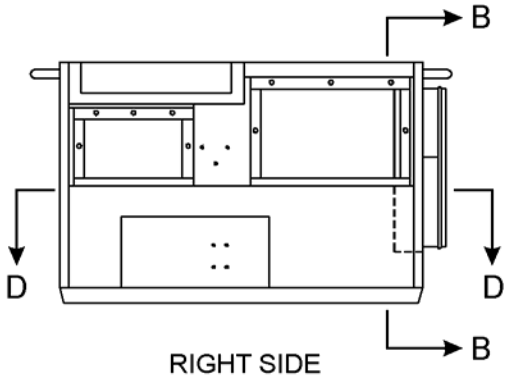
NOTE

Illustration index numbers correspond to the item numbers in WP 0047 00, Table 1.

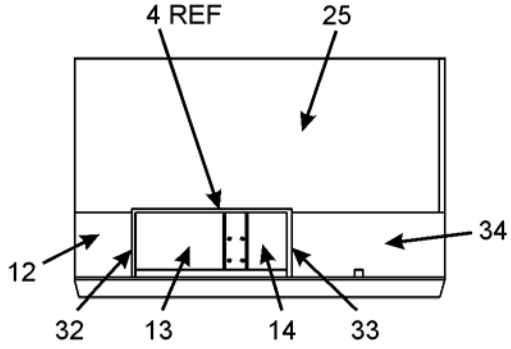
6. Remove insulation as required.



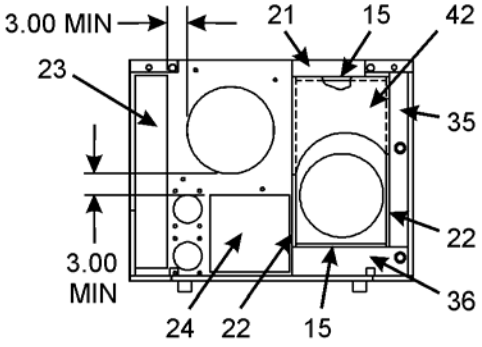
REAR



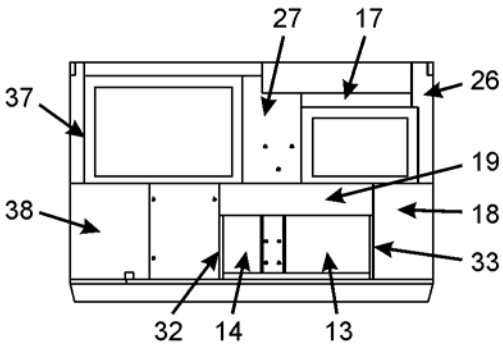
RIGHT SIDE



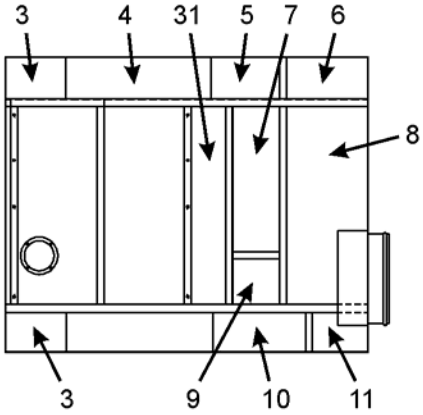
VIEW A-A
LEFT INTERNAL PANEL



VIEW B-B
FRONT INTERNAL PANEL



VIEW C-C
RIGHT INTERNAL PANEL



VIEW D-D
BOTTOM INTERNAL PANEL

ASSEMBLY

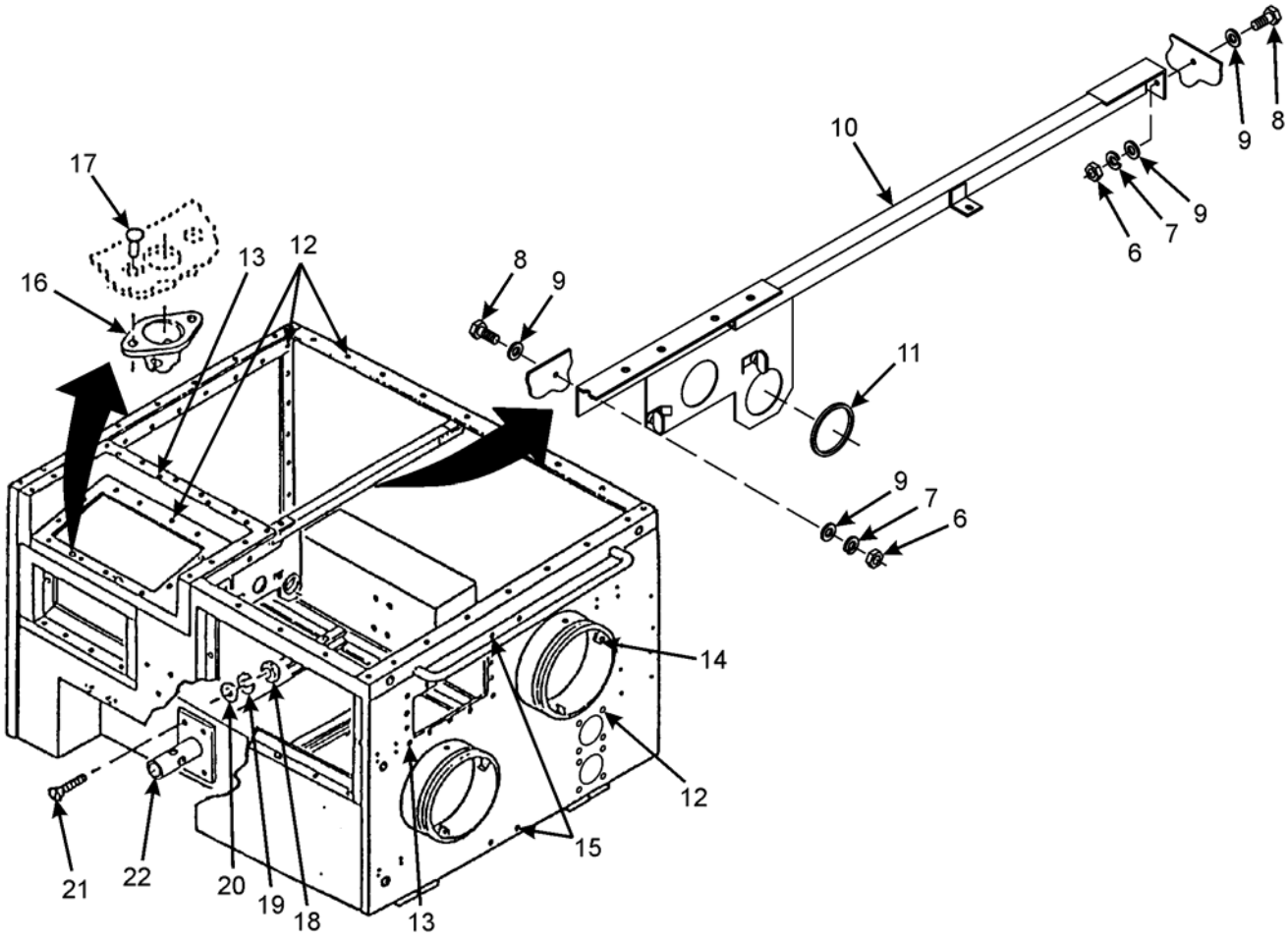
WARNING

Rubber adhesive is flammable. Keep away from open flames or other sources of ignition. Avoid breathing fumes from adhesive. Good general ventilation is normally adequate. Avoid skin contact with adhesive.

NOTE

Install insulation with rubber adhesive, except for items 3, 5 thru 11, and 31 in WP 0047 00, Table 1.

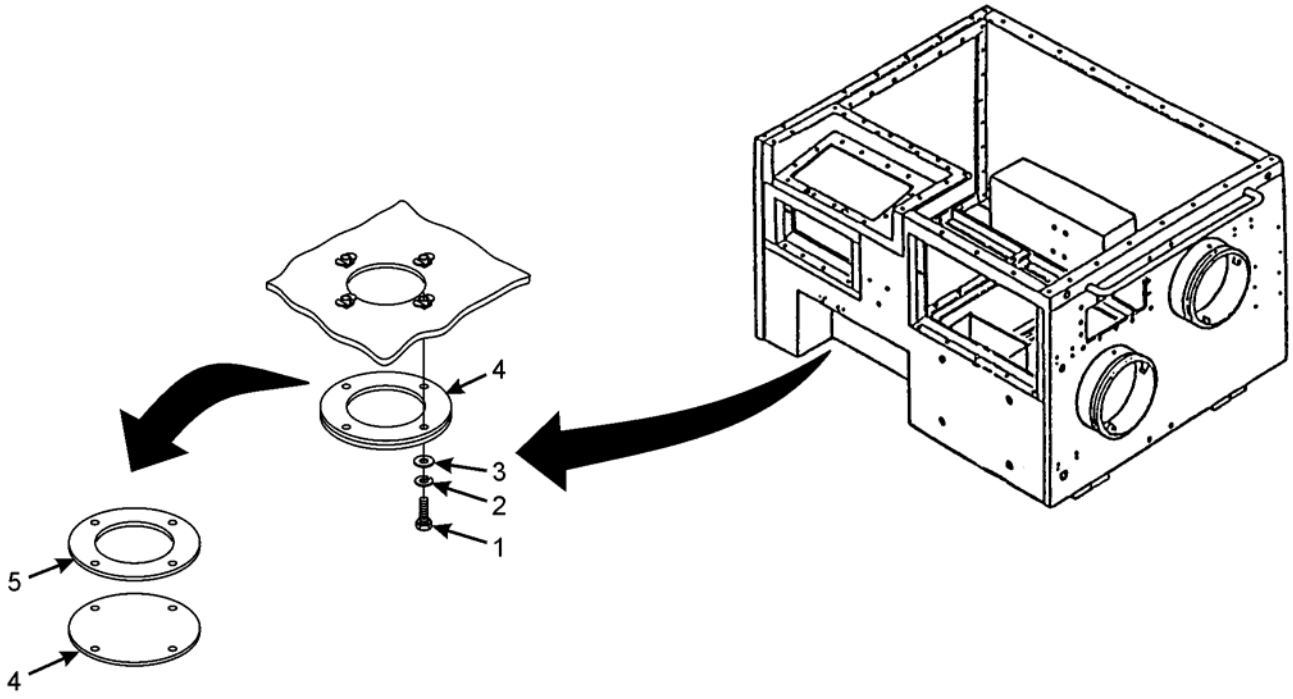
1. Apply rubber adhesive to rough side of insulation and to mating surface and install insulation.
2. Install wheel pivot (22) with four screws (21), washers (20), lockwashers (19) (item 29, WP 0062 00), and nuts (18).
3. Install two rivets (17) to secure each receptacle (16).
4. Install rivnuts (15 thru 12) (items 38, 1, 12, and 13, WP 0062 00) as required.
5. Install grommet (11) with sealing compound applied to edge of hole.
6. Install support (10) with four washers (9), two screws (8), lockwashers (7) (item 28, WP 0062 00), and nuts (6).



ASSEMBLY – Continued

7. Install gasket (5) onto fuel drain cover (4).

8. Install fuel drain cover (4) with four washers (3), lockwashers (2) (item 28, WP 0062 00), and screws (1).



END OF WORK PACKAGE

CHAPTER 8

GENERAL SUPPORT MAINTENANCE INSTRUCTIONS FOR ARMY SPACE HEATER H-140

(THERE IS NO GENERAL SUPPORT MAINTENANCE FOR THE ASH.)

CHAPTER 9

SUPPORTING INFORMATION FOR ARMY SPACE HEATER H-140

SUPPORTING INFORMATION

IMPROVED ARMY SPACE HEATER H-140

NSN 4520-01-477-0568

REFERENCES

SCOPE

This work package lists all field manuals, forms, technical manuals, and miscellaneous publications referenced in this manual and required to operate and maintain the IASH.

FIELD MANUALS

FM 3-3	Chemical and Biological Contamination Avoidance
FM 3-3-1	Nuclear Contamination Avoidance
FM 3-4	NBC Protection
FM 3-5	NBC Decontamination
FM 4-25.11	First Aid
FM 10-564	Air Drop of Supplies and Equipment, Rigging Fuel Drums
FM 10-67-1	Concepts and Equipment of Petroleum Operations
FM 31-70	Basic Cold Weather Manual
FM 31-71	Northern Operations

FORMS

DA Form 2028	Recommended Changes to Publications and Blank Forms
DA Form 2028-E	Recommended Changes to Publications and Blank Forms (EGA)
DA Form 2404	Equipment Inspection and Maintenance Worksheet
DA Form 2407	Maintenance Request
DA Form 2408-9	Equipment Control Record
DA Form 5988-E	Equipment Inspection and Maintenance Worksheet
DD Form 2326	Preservation and Packing Data
SF Form 364	Report of Discrepancy (ROD)
SF Form 368	Product Quality Deficiency Report

TECHNICAL MANUALS

TM 3-4240-338-13&P	Operator and Field Maintenance Manual (Including Repair Parts and Special Tools List) for Collective Protection Equipment, M28, for use with Tent, Extendable, Modular, Personnel (TEMPER) AMEDD Small Shelter
TM 9-4520-271-24P	Repair Parts and Special Tools List for Improved Army Space Heater (IASH), Electric Powered, Multi-Fuel, 140,000 BTU, Model H-140
TM 43-0139	Painting Instructions for Army Materiel
TM 750-244-3	Procedures for Destruction of Equipment to Prevent Enemy Use (Mobility Equipment Command)

MISCELLANEOUS PUBLICATIONS

AR 190-13	The Army Physical Security Program
AR 190-16	Physical Security
AR 735-11-2	Reporting of Supply Discrepancies
ASME Y14.38	Abbreviations and Acronyms
CTA 8-100	Army Medical Department Expendable/Durable Items
CTA 50-970	Expendable/Durable Items (Except: Medical, Class V, Repair Parts, and Heraldic Items)
DA PAM 25-30	Consolidated Index of Army Publications and Blank Forms
DA PAM 750-8	The Army Maintenance Management System (TAMMS) Users Manual
TC 9-237	Operator's Circular, Welding Theory and Application
TC 38-3	Guide for Basic Military Preservation and Packing

SUPPORTING INFORMATION

IMPROVED ARMY SPACE HEATER H-140

NSN 4520-01-477-0568

MAINTENANCE ALLOCATION CHART (MAC) INTRODUCTION

INTRODUCTION

The Army Maintenance System MAC

This introduction provides a general explanation of all maintenance and repair functions authorized at the two maintenance levels under the Two-Level Maintenance System concept.

The MAC (immediately following the introduction) designates overall authority and responsibility for the performance of maintenance functions on the identified end item or component. The application of the maintenance functions to the end item or component shall be consistent with the capacities and capabilities of the designated maintenance levels, which are shown on the MAC in column (4) as:

Field – includes three subcolumns, Crew (C), Service (O), and Field (F).

Sustainment – includes two subcolumns, Below Depot (H) and Depot (D).

The maintenance to be performed below depot and in the field is described as follows:

1. Service maintenance. The responsibility of a using organization to perform maintenance on its assigned equipment. It normally consists of inspecting, servicing, lubricating, adjusting, and replacing parts, minor assemblies, and subassemblies. The replace function for this level of maintenance is indicated by the letter "O" in the third position of the SMR code. An "O" appearing in the fourth position of the SMR code indicates complete repair is possible at the service maintenance level.
2. Field maintenance. Maintenance accomplished on a component, accessory, assembly, subassembly, plug-in unit, or other portion either on the system or after it is removed. The replace function for this level of maintenance is indicated by the letter "F" appearing in the third position of the SMR code. An "F" appearing in the fourth position of the SMR code indicates complete repair is possible at the field maintenance level. Items are returned to the user after maintenance is performed at this level.
3. Below depot sustainment. Maintenance accomplished on a component, accessory, assembly, subassembly, plug-in unit, or other portion either on the system or after it is removed. The replace function for this level of maintenance is indicated by the letter "H" appearing in the third position of the SMR code. An "H" appearing in the fourth position of the SMR code indicates complete repair is possible at the below depot sustainment maintenance level. Items are returned to the supply system after maintenance is performed at this level.

The tools and test equipment requirements table (immediately following the MAC) lists the tools and test equipment (both special tools and common tool sets) required for each maintenance function as referenced from the MAC.

The remarks table (immediately following the tools and test equipment requirements) contains supplemental instructions and explanatory notes for a particular maintenance function.

INTRODUCTION – Continued

Maintenance Functions

Maintenance functions are limited to and defined as follows:

1. Inspect. To determine the serviceability of an item by comparing its physical, mechanical, and/or electrical characteristics with established standards through examination (e.g., by sight, sound, or feel). This includes scheduled inspection and gaugings and evaluation of cannon tubes.
2. Test. To verify serviceability by measuring the mechanical, pneumatic, hydraulic, or electrical characteristics of an item and comparing those characteristics with prescribed standards on a scheduled basis, i.e., load testing of lift devices and hydrostatic testing of pressure hoses.
3. Service. Operations required periodically to keep an item in proper operating condition; e.g., to clean (includes decontaminate, when required), to preserve, to drain, to paint, or to replenish fuel, lubricants, chemical fluids, or gases. This includes scheduled exercising and purging of recoil mechanisms. The following are examples of service functions:
    a. Unpack. To remove from packing box for service or when required for the performance of maintenance operations.
    b. Repack. To return item to packing box after service and other maintenance operations.
    c. Clean. To rid the item of contamination.
    d. Touch up. To spot paint scratched or blistered surfaces.
    e. Mark. To restore obliterated identification.
4. Adjust. To maintain or regulate, within prescribed limits, by bringing into proper position, or by setting the operating characteristics to specified parameters.
5. Align. To adjust specified variable elements of an item to bring about optimum or desired performance.
6. Calibrate. To determine and cause corrections to be made or to be adjusted on instruments of test, measuring, and diagnostic equipment used in precision measurement. Consists of comparisons of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared.
7. Remove/Install. To remove and install the same item when required to perform service or other maintenance functions. Install may be the act of emplacing, seating, or fixing into position a spare, repair part, or module (component or assembly) in a manner to allow the proper functioning of an equipment or system.
8. Paint (ammunition only). To prepare and spray color coats of paint so that the ammunition can be identified and protected. The color indicating primary use is applied, preferably, to the entire exterior surface as the background color of the item. Other markings are to be repainted as original so as to retain proper ammunition identification.
9. Replace. To remove an unserviceable item and install a serviceable counterpart in its place. “Replace” is authorized by the MAC and assigned maintenance level is shown as the third position code of the Source, Maintenance and Recoverability (SMR) code.
10. Repair. The application of maintenance services, including fault location/troubleshooting, removal/installation, disassembly/assembly procedures, and maintenance actions to identify troubles and restore serviceability to an item by correcting specific damage, fault, malfunction, or failure in a part, subassembly, module (component or assembly), end item, or system.

INTRODUCTION – Continued

NOTE

The following definitions are applicable to the "repair" maintenance function:

Services – Inspect, test, service, adjust, align, calibrate, and/or replace.

Fault location/troubleshooting – The process of investigating and detecting the cause of equipment malfunctioning; the act of isolating a fault within a system or Unit Under Test (UUT).

Disassembly/assembly – The step-by-step breakdown (taking apart) of a spare/functional group coded item to the level of its least component, that is assigned an SMR code for the level of maintenance under consideration (i.e., identified as maintenance significant).

Actions – Welding, grinding, riveting, straightening, facing, machining, and/or resurfacing.

11. Overhaul. That maintenance effort (service/action) prescribed to restore an item to a completely serviceable/ operational condition as required by maintenance standards in appropriate technical publications. Overhaul is normally the highest degree of maintenance performed by the Army. Overhaul does not normally return an item to like new condition.
12. Rebuild. Consists of those services/actions necessary for the restoration of unserviceable equipment to a like-new condition in accordance with original manufacturing standards. Rebuild is the highest degree of materiel maintenance applied to Army equipment. The rebuild operation includes the act of returning to zero those age measurements (e.g., hours/miles) considered in classifying Army equipment/components.

Explanation of Columns in the MAC

Column (1) – Group Number. Column (1) lists FGC numbers, the purpose of which is to identify maintenance significant components, assemblies, subassemblies, and modules with the Next Higher Assembly (NHA).

Column (2) – Component/Assembly. Column (2) contains the item names of components, assemblies, subassemblies, and modules for which maintenance is authorized.

Column (3) – Maintenance Function. Column (3) lists the functions to be performed on the item listed in column (2). (For a detailed explanation of these functions, refer to "Maintenance Functions" outlined above.)

Column (4) – Maintenance Level. Column (4) specifies each level of maintenance authorized to perform each function listed in column (3), by indicating work time required (expressed as manhours in whole hours or decimals) in the appropriate subcolumn. This work time figure represents the active time required to perform that maintenance function at the indicated level of maintenance. If the number or complexity of the tasks within the listed maintenance function varies at different maintenance levels, appropriate work time figures are to be shown for each level. The work time figure represents the average time required to restore an item (assembly, subassembly, component, module, end item, or system) to a serviceable condition under typical field operating conditions. This time includes preparation time (including any necessary disassembly/assembly time), troubleshooting/fault location time, and quality assurance time in addition to the time required to perform the specific tasks identified for the maintenance functions authorized in the MAC. The symbol designations for the various maintenance levels are as follows:

INTRODUCTION – Continued

Field:

C – Crew maintenance

O – Service maintenance

F – Field maintenance

Sustainment:

L - Specialized Repair Activity (SRA)

H - Below depot maintenance

D - Depot maintenance

NOTE

The "L" maintenance level is not included in column (4) of the MAC. Functions to this level of maintenance are identified by a work time figure in the "H" column of column (4), and an associated reference code is used in the REMARKS column (6). This code is keyed to the remarks and the SRA complete repair application is explained there.

Column (5) – Tools and Equipment Reference Code. Column (5) specifies, by code, those common tool sets (not individual tools), common Test, Measurement, and Diagnostic Equipment (TMDE), and special tools, special TMDE, and special support equipment required to perform the designated function. Codes are keyed to the entries in the tools and test equipment table.

Column (6) – Remarks Code. When applicable, this column contains a letter code, in alphabetical order, which is keyed to the remarks table entries.

Explanation of Columns in the Tools and Test Equipment Requirements

Column (1) – Tool or Test Equipment Reference Code. The tool or test equipment reference code correlates with a code used in column (5) of the MAC.

Column (2) – Maintenance Level. The lowest level of maintenance authorized to use the tool or test equipment.

Column (3) – Nomenclature. Name or identification of the tool or test equipment.

Column (4) – National Stock Number (NSN). The NSN of the tool or test equipment.

Column (5) – Tool Number. The manufacturer's part number.

Explanation of Columns in the Remarks

Column (1) – Remarks Code. The code recorded in column (6) of the MAC.

Column (2) – Remarks. This column lists information pertinent to the maintenance function being performed as indicated in the MAC.

SUPPORTING INFORMATION

IMPROVED ARMY SPACE HEATER H-140

NSN 4520-01-477-0568

MAINTENANCE ALLOCATION CHART (MAC)

Table 1. MAC for Improved Army Space Heater (IASH).

(1)	(2)	(3)	(4) MAINTENANCE LEVEL					(5)	(6)
			FIELD			SUSTAINMENT			
			CREW	SERVICE	FIELD	BELOW DEPOT	DEPOT	TOOLS AND EQUIPMENT REF CODE	REMARKS CODE
GROUP NUMBER	COMPONENT/ASSEMBLY	MAINTENANCE FUNCTION	C	O	F	H	D		
00	ARMY SPACE HEATER, 140,000 BTU/HR	Inspect Repair Replace Service Test	0.2	0.2 2.0 1.0 0.5 1.0	0.2 2.0			 1-10 1	A,B
01	EXHAUST PIPE, HOSE, COVERS, DOORS, AND PANELS	Inspect Repair Replace	0.2	 1.0 1.0				 2,6,8,10 6,10	
0101	COVER ASSEMBLY, CONTROL BOX	Inspect Repair Replace	0.1	 0.5 1.0				 6,10 6,10	
0102	PANEL ASSEMBLY, TOP	Inspect Repair Replace	0.1	 0.5 1.0				 6,10 6,10	
0103	PANEL ASSEMBLY, REAR	Inspect Repair Replace	0.1	 1.0	 0.5			 2,6,10 6,10	
0104	DOOR ASSEMBLY, FAN	Inspect Repair Replace	0.1	 0.5 1.0				 6,10 6,10	
0105	DOOR ASSEMBLY, SIDE, REAR	Inspect Repair Replace	0.1	 0.5 1.0				 6,10 6,10	
0106	COVER, DUCT ASSEMBLY	Inspect Repair Replace	0.1	 0.5 1.0				 6,8,10 6,10	

MAC – Continued

Table 1. MAC for Improved Army Space Heater (IASH).

(1)	(2)	(3)	(4) MAINTENANCE LEVEL					(5)	(6)
			FIELD			SUSTAINMENT			
GROUP NUMBER	COMPONENT/ASSEMBLY	MAINTENANCE FUNCTION	CREW C	SERVICE O	FIELD F	BELOW DEPOT H	DEPOT D	TOOLS AND EQUIPMENT REF CODE	REMARKS CODE
02	CONTROLS AND COMBUSTION ASSEMBLIES	Inspect	0.8						
		Repair		2.0	2.0			2,6,8,9,10	
		Replace			2.0			2,6,8,9,10	
0201	ELECTRICAL CONTROL ASSEMBLY	Inspect	0.2						
		Repair		1.0	2.5			2,6,8,9,10	
		Replace			3.0				
		Test		1.0				1	
0202	FUEL PRESSURE GAGE AND TUBE ASSEMBLY	Inspect	0.1						
		Repair		1.0				6,10	
		Replace		1.0				6,10	
0203	COMBUSTION CONTROL ASSEMBLY	Inspect	0.1						
		Repair		1.5				6,10	
		Replace		1.0				6,10	
		Test		1.0				1	
03	HOSE, TUBE, AND TANK ASSEMBLIES	Inspect	0.7	0.5					
		Repair		2.0				6,10	
		Replace		2.0				6,10	
0301	HOSE ASSEMBLY, FUEL, EXTERNAL	Inspect	0.1						
		Repair		1.0				6,10	
		Replace		0.5				6,10	
0302	TUBE ASSEMBLIES	Inspect	0.1	0.1					
		Replace		0.5				6,10	A
0303	TANK, FUEL, TOP ASSEMBLY	Inspect	0.1	0.1					
		Repair		1.5				6,10	
		Replace		1.5				6,10	
04	VENTILATION AIR FAN/PUMP/MOTOR ASSEMBLY	Inspect	0.2	0.2					
		Repair		4.0	2.0			8	
		Replace		2.0	1.0			1,6,10	
0401	VENTILATION AIR FAN AND MOTOR ASSEMBLY	Inspect							
		Repair		2.0				1,6,10	
		Replace		1.0				1,6,10	

MAC – Continued

Table 1. MAC for Improved Army Space Heater (IASH).

(1)	(2)	(3)	(4) MAINTENANCE LEVEL					(5)	(6)
			FIELD			SUSTAINMENT			
			CREW	SERVICE	FIELD	BELOW DEPOT	DEPOT		
GROUP NUMBER	COMPONENT/ASSEMBLY	MAINTENANCE FUNCTION	C	O	F	H	D	TOOLS AND EQUIPMENT REF CODE	REMARKS CODE
0402	FUEL PUMP AND SOLENOID VALVES	Inspect							
		Repair		2.0				1,6,10	
		Replace		1.0				1,6,10	
0403	VENTILATION AIR FAN MOTOR AND SCROLL BASE	Inspect							
		Repair			2.0			8	
		Replace			1.0			1,6,10	
05	COMBUSTION AIR HOSE, FAN, AND MOUNT ASSEMBLY	Inspect	0.1						
		Repair		2.0				6,10	
		Replace		2.0				6,10	
06	HEAT EXCHANGER ASSEMBLY	Inspect	0.1	0.4	0.2				
		Repair		3.5	4.0			1,6,8,9,10	
		Replace			4.0			1,6,8,9,10	
0601	PLATE, COVER, THERMOSTAT ASSEMBLY	Inspect	0.1	0.1					
		Repair		0.5				6,10	
		Replace		1.0				6,10	
		Test		1.0				1	
060101	WIRING HARNESS ASSEMBLY	Inspect		0.1					
		Repair		1.0				1,6,10	
		Replace		1.0				1,6,10	
		Test		0.5				1	
0602	HEAT EXCHANGER ASSEMBLY	Inspect			0.5				
		Repair			2.0			8,10	
		Replace			2.0			8,10	
0603	BURNER ASSEMBLY	Inspect			0.5				
		Repair			2.0			8,10	
		Replace			2.0			8,10	
07	REMOTE CONTROL BOX ASSEMBLY, DETECTOR, CARBON MONOXIDE	Inspect		0.4					
		Repair		2.0				1,6,10	
		Replace		1.5				1,6,10	
		Test		1.0				1	

MAC – Continued

Table 1. MAC for Improved Army Space Heater (IASH).

(1)	(2)	(3)	(4) MAINTENANCE LEVEL					(5)	(6)
			FIELD			SUSTAINMENT			
			CREW	SERVICE	FIELD	BELOW DEPOT	DEPOT		
GROUP NUMBER	COMPONENT/ASSEMBLY	MAINTENANCE FUNCTION	C	O	F	H	D	TOOLS AND EQUIPMENT REF CODE	REMARKS CODE
0701	REMOTE CONTROL BOX CABLE ASSEMBLY P3	Inspect		0.2					
		Repair		1.0				1,6,10	
		Replace		0.5				1,6,10	
		Test		0.5				1	
08	POWER CABLE ASSEMBLY P1	Inspect		0.2					
		Repair		1.0				1,6,10	
		Replace		0.5				1,6,10	
		Test		0.5				1	
09	EXTERNAL ELECTRICAL LEAD ASSEMBLY	Inspect		0.2					
		Repair		1.0				1,6,10	
		Replace		0.5				1,6,10	
		Test		0.5				1	
10	INTERNAL REMOTE CONTROL BOX CABLE ASSEMBLY J3	Inspect		0.2					
		Repair		1.0				1,6,10	
		Replace		0.5				1,6,10	
		Test		0.5				1	
11	JACK AND WHEEL ASSEMBLY, JACK ASSEMBLY	Inspect	0.1	0.2					
		Repair		2.0				6,10	
		Replace		2.0				6,10	
		Service		0.5					
1101	WHEEL ASSEMBLY	Inspect		0.2					
		Repair		2.0				6,10	
		Replace		2.0				6,10	
		Service		0.5					
12	FRESH AIR DAMPER ASSEMBLY	Inspect		0.1	0.1				
		Repair		2.0				8,10	
		Replace		1.0	2.0			6,8,9,10	
13	EYEBOLT, TIEDOWN, AND FRAME	Inspect	0.3		0.3				
		Repair		3.0	3.5			2,6,10	
		Replace			5.0			6,8,9,10	
1301	SUPPORT, CONTROL BOX	Inspect			0.1				
		Repair			1.0			2,6,9,10	
		Replace			1.0			6,10	

MAC – Continued

Table 1. MAC for Improved Army Space Heater (IASH).

(1)	(2)	(3)	(4) MAINTENANCE LEVEL					(5)	(6)
			FIELD			SUSTAINMENT			
			CREW	SERVICE	FIELD	BELOW DEPOT	DEPOT	TOOLS AND EQUIPMENT REF CODE	REMARKS CODE
GROUP NUMBER	COMPONENT/ASSEMBLY	MAINTENANCE FUNCTION	C	O	F	H	D		
1302	RING, TIEDOWN, CABINET ASSEMBLY, FRAME ASSEMBLY	Inspect Repair Replace	0.1	1.0	0.2 2.5 4.0			3-7,9,10 6,8,9,10	B
1303	COMPARTMENT, HANDBOOK	Inspect Repair Replace	0.1	1.0 1.0				2,6,10 2,6,10	

TOOLS AND TEST EQUIPMENT REQUIREMENTS

Table 2. Tools and Test Equipment for Improved Army Space Heater (IASH).

TOOL OR TEST EQUIPMENT	MAINTENANCE LEVEL	NOMENCLATURE	NATIONAL STOCK NUMBER	TOOL NUMBER
1	O	MULTIMETER	5180-00-596-1474	AN/PSM-45
2	O	RIVETER, BLIND, HAND	5120-00-017-2849	98 OR EQUIVALENT (54402)
3	F	RIVNUT TOOL	5120-00-177-9839	C-845/10-32 (03481)
4	F	RIVNUT TOOL	5120-00-679-6523	C7223118 (03481)
5	F	RIVNUT TOOL	5120-00-970-6423	C-845/1/4”-20 (25472)
6	O	SHOP EQUIPMENT, AUTOMOTIVE MAINTENANCE, COMMON NO. 1	4910-00-754-0654	SC-4910-95-CL-A74
7	F	SHOP EQUIPMENT, WELDING: FIELD MAINTENANCE	4940-00-357-7268	SC-4910-95-CL-B-19-HR
8	F	SHOP SET, ELECTRICAL REPAIR	4940-00-294-9517	SC-4940-95-CL-B05
9	O	TOOL KIT, GENERAL MECHANIC’S	5180-00-699-5273	SC-5180-95-N05
10	O	TOOL KIT, GENERAL MECHANIC’S, AUTOMOTIVE	5180-00-177-7033	SC-5180-95-N26

REMARKS

Table 3. Remarks for Improved Army Space Heater (IASH).

REMARK CODE	REMARKS
A	THIS FUNCTIONAL GROUP COVERS THE MAINTENANCE FUNCTIONS OF SEVERAL TUBE ASSEMBLIES.
B	WELDING PROCEDURES; REFER TO TC 9-237, OPERATOR’S CIRCULAR, WELDING THEORY AND APPLICATION.

SUPPORTING INFORMATION

IMPROVED ARMY SPACE HEATER H-140

NSN 4520-01-477-0568

COMPONENTS OF END ITEM (COEI) AND BASIC ISSUE ITEMS (BII) LISTS

INTRODUCTION

Scope

This work package lists COEI and BII for the IASH to help you inventory items for safe and efficient operation of the equipment.

General

The COEI and BII information is divided into the following lists:

Components of End Item (COEI). This list is for information purposes only and is not authority to requisition replacements. These items are part of the IASH. As part of the end item, these items must be with the end item whenever it is issued or transferred between property accounts. Items of COEI are removed and separately packaged for transportation or shipment only when necessary. Illustrations are furnished to help you find and identify the items.

Basic Issue Items (BII). These essential items are required to place the IASH in operation, operate it, and to do emergency repairs. Although shipped separately packaged, BII must be with the IASH during operation and when it is transferred between property accounts. Listing these items is your authority to request/requisition them for replacement based on authorization of the end item by the TOE/MTOE. Illustrations are furnished to help you find and identify the items.

Explanation of Columns in the COEI List and BII List

Column (1) – Illus Number. Gives you the number of the item illustrated.

Column (2) – National Stock Number (NSN). Identifies the stock number of the item to be used for requisitioning purposes.

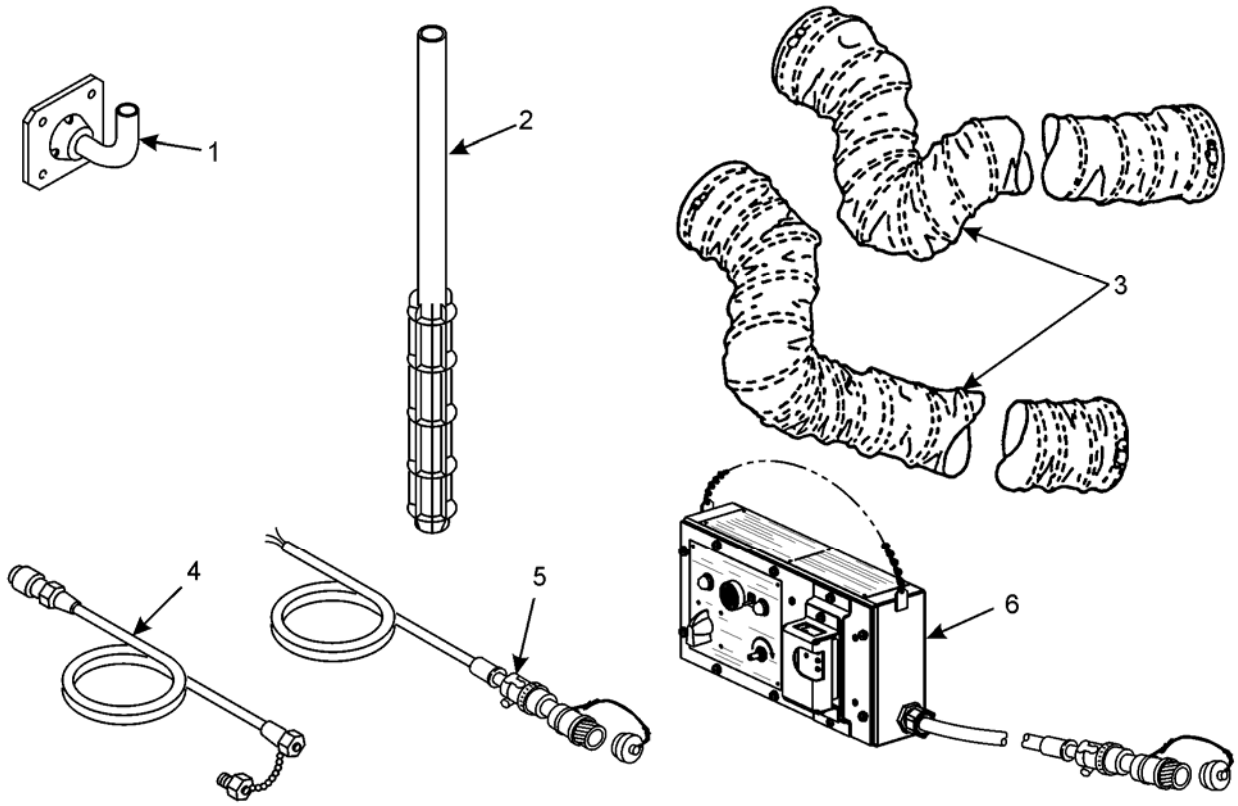
Column (3) – Description, CAGEC, and Part Number. Identifies the Federal item name (in all capital letters) followed by a minimum description when needed. The stowage location of COEI and BII is also included in this column. The last line below the description is the CAGEC (commercial and Government entity code) (in parentheses) and the part number.

Column (4) – Usable On Code. When applicable, gives you a code if the item you need is not the same for different models of equipment.

Column (5) – Unit of Measure (U/M). Indicates the physical measurement or count of the item as issued per the National Stock Number shown in column (2).

Column (6) – Qty Rqr. Indicates the quantity required.

COEI LIST



COEI LIST – Continued

Table 1. Components of End Item List.

(1) ILLUS NUMBER	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION, CAGEC, AND PART NUMBER	(4) USABLE ON CODE	(5) U/M	(6) QTY RQR
1	4520-01-398-8361	ELBOW, EXHAUST (on center wall) (90598) 60557-100	–	EA	1
2	4520-01-399-0872	EXHAUST PIPE (in exhaust pipe storage compartment) (90598) 60561-100	–	EA	1
3	4720-01-389-9929	HOSE ASSEMBLY, SUPPLY AND RETURN AIR (in shipping container) (16632) M38386B2D015	–	EA	2
4	–	HOSE, FUEL, EXTERNAL (on floor below side rear door) (90598) 60210-100	–	EA	1
5	6150-01-335-3449	LEAD ASSEMBLY, ELECTRICAL (Power Cable Adapter) (on floor below side rear door) (97403) 13229E8567	–	EA	1
6	–	REMOTE CONTROL BOX (on top of ventilation air fan) (90598) 60250-100	–	EA	1

BII LIST

TM 9-4520-271-14

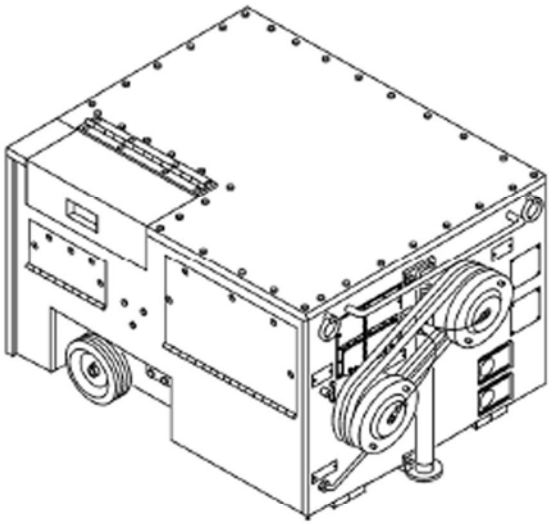
TECHNICAL MANUAL

OPERATOR'S, UNIT, DIRECT SUPPORT,
AND GENERAL SUPPORT
MAINTENANCE MANUAL

FOR

IMPROVED ARMY SPACE HEATER (IASH), ELECTRIC POWERED, MULTI-FUEL, 140,000 BTU, MODEL H-140

NSN 4520-01-477-0568 (EIC: IMS)



1

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HEADQUARTERS, DEPARTMENT OF THE ARMY
15 AUGUST 2005

BII LIST – Continued

Table 2. Basic Issue Items List.

(1) ILLUS NUMBER	(2) NATIONAL STOCK NUMBER	(3) DESCRIPTION, CAGEC, AND PART NUMBER	(4) USABLE ON CODE	(5) U/M	(6) QTY RQR
1	–	TECHNICAL MANUAL, OPERATOR'S, UNIT, DIRECT SUPPORT, AND GENERAL SUPPORT MAINTENANCE MANUAL FOR IMPROVED ARMY SPACE HEATER (IASH), ELECTRIC POWERED, MULTI-FUEL, 140,000 BTU, MODEL H-140, TM 9-4520-271-14 (in handbook compartment)	–	EA	1

SUPPORTING INFORMATION

ARMY SPACE HEATER H-140

NSN 4520-01-477-0568

ADDITIONAL AUTHORIZATION LIST (AAL)

INTRODUCTION

Scope

This work package lists additional items you are authorized for the support of the ASH.

General

This list identifies items that do not have to accompany the ASH and that do not have to be turned in with it. These items are all authorized to you by CTA, MTOE, TDA, or JTA.

Explanation of Columns in the AAL

Column (1) – National Stock Number (NSN). Identifies the stock number of the item to be used for requisitioning purposes.

Column (2) – Description, Commercial and Government Entity Code (CAGEC), and Part Number (P/N). Identifies the Federal item name (in all capital letters) followed by a minimum description when needed. The last line below the description is the CAGEC (in parentheses) and the part number.

Column (3) – Usable On Code. When applicable, gives you a code if the item you need is not the same for different models of equipment.

Column (4) – Unit of Measure (U/M). Indicates the physical measurement or count of the item as issued per the National Stock Number shown in column (1).

Column (5) – Qty Recm. Indicates the quantity recommended.

SUPPORTING INFORMATION

ARMY SPACE HEATER H-140

NSN 4520-01-477-0568

ADDITIONAL AUTHORIZATION LIST (AAL)

AAL

Table 1. Additional Authorization List.

(1) NATIONAL STOCK NUMBER	(2) DESCRIPTION, CAGEC, AND PART NUMBER	(3) USABLE ON CODE	(4) U/M	(5) QTY RECM
4920-01-479-5383	ADAPTER ASSEMBLY, INTERFACE DEVICE (Chemical and Biological Protection Kit): (90598) 60872-100 Consisting of the following:	–	EA	1
–	ADAPTER (90598) 60871-100	–	EA	2
4730-00-908-6293	CLAMP (96906) MS35842-15	–	EA	2
–	HOSE, AIR DUCT (90598) 60878-1	–	EA	1
–	HOSE, AIR DUCT (90598) 60879-1	–	EA	1
5305-00-225-3839	SCREW, MACHINE (96906) MS90725-8	–	EA	8
5310-00-809-4058	WASHER, FLAT (96906) MS27183-10	–	EA	8
5310-00-582-5965	WASHER, LOCK (96906) MS35338-44	–	EA	8
5120-00-234-8913	SCREWDRIVER, CROSS TIP: 4 in. long blade; no. 2: plastic handle (19207) 11655777-12	–	EA	1
5120-00-237-6985	SCREWDRIVER, FLAT TIP: 3/8 in. wide tip; 8 in. long blade; plastic handle (19207) 11655777-10	–	EA	1

SUPPORTING INFORMATION

ARMY SPACE HEATER H-140

NSN 4520-01-477-0568

EXPENDABLE AND DURABLE ITEMS LIST

INTRODUCTION

Scope

This work package lists expendable and durable items that you will need to operate and maintain the ASH. This list is for information only and is not authority to requisition the listed items. These items are authorized to you by CTA 50-970, Expendable/Durable Items (Except: Medical, Class V, Repair Parts, and Heraldic Items), or CTA 8-100, Army Medical Department Expendable/Durable Items.

Explanation of Columns in the Expandable and Durable Items List

Column (1) - Item Number. This number is assigned to the entry in the list and is referenced in the narrative instructions to identify the item (e.g., “Use anti-seize compound (item 2, WP 0061 00).”).

Column (2) - Level. This column includes the lowest level of maintenance that requires the listed item (C = Operator/ Crew).

Column (3) - National Stock Number (NSN). This is the NSN assigned to the item which you can use to requisition it.

Column (4) - Item Name, Description, Commercial and Government Entity Code (CAGEC), and Part Number (P/N). This column provides the other information you need to identify the item.

Column (5) - Unit of Measure (U/M). This code shows the physical measurement or count of an item, such as gallon, dozen, gross, etc.

EXPENDABLE AND DURABLE ITEMS LIST

Table 1. Expendable and Durable Items List.

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) ITEM NAME, DESCRIPTION, CAGEC, PART NUMBER	(5) U/M
1	O	8040-01-344-6443	Adhesive, Rubber, 1 pint can (03938) 520	PT
2	O	8030-01-244-7179	Anti-seize Compound, 16 ounce can (05972) MIL-A-907, 771	CN
3	O	6850-01-472-2722	Cleaning Compound, Solvent, 1 gallon (81349) MIL-PRF-680	GAL
4	C	7930-00-068-1669	Detergent, General Purpose, 1/2 gallon bottle (83421)	BTL
5	C	9140-00-286-5286	Fuel, Diesel, DF-1, bulk (58536) A-A-52557	GAL
6	C	9140-00-286-5294	Fuel, Diesel, DF-2, bulk (58536) A-A-52577	GAL
7	C	9140-00-286-5283	Fuel, Diesel, DF-A, bulk (81348) VVF-800	GAL
8	C	5130-01-031-5816	Fuel, Turbine, Aviation, JP-8, bulk (81349) MIL-T-83133	GAL
9	O	5330-01-431-0622	Gasket Material, 1/2 in. x 15 ft. (0AMD8) 0015F	EA
10	O	9150-00-190-0906	Grease, Automotive and Artillery, 25 pound pail (81349) MIL-G-10924	PL
11	F	9150-01-008-0959	Grease, General Purpose, Silicone, 8 ounce tube (71984)	TU
12	O	9150-00-185-0629	Oil, Lubricating, General Purpose, 2 ounce can (72527) Tectyl 800	CN
13	F	8030-01-388-5604	Primer, Sealing Compound, 1.75 ounce bottle (05972) 19267	BTL
14	C	7920-00-205-1711	Rag, Wiping, Cotton, 50 pound bale (80244)	BE
15	F	8010-00-873-9315	Sealer, Lacquer, Acrylic Resin, 1 pint aerosol can (54636) MIL-TT-L-50, Krylon 1302	CN
16	O	8030-01-464-6132	Sealing Compound (0PMN0) Sikaflex1A	KT
17	O	8030-01-329-6338	Sealing Compound, 50 cc tube (61078) LH-150	TU

EXPENDABLE AND DURABLE ITEMS LIST – Continued

Table 1. Expendable and Durable Items List – Continued.

(1) ITEM NUMBER	(2) LEVEL	(3) NATIONAL STOCK NUMBER	(4) ITEM NAME, DESCRIPTION, CAGEC, PART NUMBER	(5) U/M
18	O	8030-01-323-4503	Sealing Compound, Gasket, Silicone, Blue, 3 ounce tube (05972) 30560	TU
19	F	8030-01-231-7156	Sealing Compound, Retaining, 50 cc bottle (05972) Locktite 609	BTL
20	O	8030-01-445-7580	Sealing Compound, Thread Locking, Type II, Grade M, Purple, 10 cc bottle (05972) Locktite 222	BTL
21	O	8030-01-063-7510	Sealing Compound, Thread Locking, Type I, Grade L, Red, 50 cc bottle (80244) MIL-S-46163	BTL
22	F	5970-01-273-0198	Sleeving, Insulation, Electrical, 12 in. (06090) WCSM-43/12-300S	EA
23	O	3439-01-153-2077	Solder, Tin Alloy, Rosin Core, 1/2 pound spool (81346) SN60WRAP3	SP
24	O	5975-01-273-8133	Strap, Electrical Tiedown, 100 each package (96906) MS3367-3	HD
25	O	9905-00-537-8954	Tag, Marker, 50 each bundle (81349) MIL-T-12755	BDL
26	O	7150-00-778-6383	Tape, Pressure Sensitive Adhesive, 3 in. wide, green, 36 yard roll (52152) 471	RL

SUPPORTING INFORMATION

ARMY SPACE HEATER H-140

NSN 4520-01-477-0568

MANDATORY REPLACEMENT PARTS LIST

INTRODUCTION

This work package includes a list of all mandatory replacement parts referenced in the task initial setups and procedures. These are items that must be replaced during maintenance whether they have failed or not. This includes items based on usage intervals such as miles, time, rounds fired, etc.

MANDATORY REPLACEMENT PARTS LIST

Table 1. Mandatory Replacement Parts List.

ITEM NO.	PART NUMBER/ CAGEC	NSN	NOMENCLATURE	QTY
1	A10K80 (03481)	5310-00-225-4680	RIVNUT	
2	A31B125 (03481)	5310-00-952-3603	RIVNUT	
3	AD42AH (06888)	5320-01-110-7954	RIVET, BLIND	
4	AD42H (07707)	5320-01-295-9924	RIVET, BLIND	
5	AD42S (07707)	5320-00-957-3582	RIVET, BLIND	
6	AD43H (07707)	5320-01-145-9207	RIVET, BLIND	
7	AD62H (07707)	5320-00-956-7362	RIVET, BLIND	
8	AD64H (07707)	5320-00-956-7355	RIVET, BLIND	
9	AD66ABS (07707)	5320-00-409-6841	RIVET, BLIND	
10	AK43H (07707)	5320-00-143-6149	RIVET, BLIND	
11	AS568-035 (90598)	_	PREFORMED PACKING	
12	ITR10-130SD (0VK23)	5320-01-467-4309	RIVNUT	
13	ITR25-165SD (0VK23)	5320-01-467-4627	RIVNUT	

MANDATORY REPLACEMENT PARTS LIST – Continued

Table 1. Mandatory Replacement Parts List – Continued.

ITEM NO.	PART NUMBER/ CAGEC	NSN	NOMENCLATURE	QTY
14	MS21044N3 (96906)	5310-00-877-5797	NUT, SELF-LOCKING	
15	MS21044N08 (80205)	5310-00-811-3494	NUT, SELF-LOCKING	
16	MS24665-142 (80205)	5315-00-187-9528	PIN, COTTER	
17	MS24665-357 (96906)	5315-00-298-1481	PIN, COTTER	
18	MS24665-372 (80205)	5315-00-059-0491	PIN, COTTER	
19	MS24665-377 (96906)	5315-00-236-8363	PIN, COTTER	
20	MS35333-37 (96906)	5310-00-579-0079	LOCKWASHER	
21	MS35333-38 (96906)	5310-00-559-0070	LOCKWASHER	
22	MS35333-39 (96906)	5310-00-576-5752	LOCKWASHER	
23	MS35333-40 (96906)	5310-00-550-1130	LOCKWASHER	
24	MS35333-46 (96906)	5310-00-543-4385	LOCKWASHER	
25	MS35338-40 (96906)	5310-00-543-2410	LOCKWASHER	
26	MS35338-42 (96906)	5310-00-045-3299	LOCKWASHER	
27	MS35338-43 (96906)	5310-00-045-3296	LOCKWASHER	
28	MS35338-44 (96906)	5310-00-582-5965	LOCKWASHER	
29	MS35338-45 (96906)	5310-00-407-9566	LOCKWASHER	
30	MS35338-46 (96906)	5310-01-315-3803	LOCKWASHER	
31	MS35338-136 (96906)	5310-00-929-6395	LOCKWASHER	
32	MS35338-138 (96906)	5310-00-933-8120	LOCKWASHER	

MANDATORY REPLACEMENT PARTS LIST – Continued

Table 1. Mandatory Replacement Parts List – Continued.

ITEM NO.	PART NUMBER/ CAGEC	NSN	NOMENCLATURE	QTY
33	MS35338-139 (96906)	5310-01-422-3905	LOCKWASHER	
34	MS51922-9 (96906)	5310-00-984-3806	NUT, SELF-LOCKING	
35	MS9955-023 (96906)	5331-01-398-4995	O-RING	
36	OR239-1695-707 (8L582)	5331-01-329-9654	O-RING	
37	RK22244 (55752)	5331-01-360-0944	O-RING	
38	S25P280 (83187)	5310-01-198-1722	RIVNUT	
39	0-1290/056762 (76385)	5331-01-410-8140	O-RING	
40	60499-1 (95059)	_	GASKET, FUEL DRAIN COVER	
41	77014-0053 (1VA04)	_	GASKET	
42	60717-1 (90598)	5330-01-398-9728	GASKET	
43	9452K338 (39428)	_	O-RING	

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By Order of the Secretary of the Army:

PETER J. SCHOOMAKER
General, United States Army
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9. Pub Title: TM
10. Publication Date: 04-JUL-85
11. Change Number: 7
12. Submitter Rank: MSG
13. Submitter FName: Joe
14. Submitter MName: T
15. Submitter LName: Smith
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17. Problem: 1
18. Page: 2
19. Paragraph: 3
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21. NSN: 5
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23. Figure: 7
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RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS For use of this form, see AR 25-30; the proponent agency is ODISC4.	Use Part II *(reverse)* for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).	DATE 21 October 2003

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PART I – ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS

PUBLICATION/FORM NUMBER	DATE	TITLE
TM 10-1670-296-23&P	30 October 2002	Unit Manual for Ancillary Equipment for Low Velocity Air Drop Systems

ITEM NO.	PAGE NO.	PARA-GRAPH	LINE NO. *	FIGURE NO.	TABLE NO.	RECOMMENDED CHANGES AND REASON *(Provide exact wording of recommended changes, if possible).*
	0036 00-2				1	*In Table 1, Sewing Machine Code Symbols, the second sewing machine code symbol should be MDZZ not MD22* *Change the manual to show Sewing Machine, Industrial: Zig-Zag; 308 stitch; medium-duty; NSN 3530-01-181-1421 as a MDZZ code symbol.*

**Reference to line numbers within the paragraph or subparagraph.*

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SAMPLE

TO: (*Forward direct to addressee listed in publication*)	**FROM:** (*Activity and location) (Include ZIP Code*)	**DATE**
US ARMY TACOM LIFE CYCLE MANAGEMENT COMMAND ATTN: AMSTA-LC-SECT 15 KANSAS ST NATICK, MA 01760-5052	*PFC JANE DOE* *Co A 3RD Engineer Br.* *Ft Leonard Wood, MO 63108*	21 October 2003

PART II – REPAIR PARTS AND SPECIAL TOOL LISTS AND SUPPLY CATALOGS/SUPPLY MANUALS

PUBLICATION NUMBER	DATE	TITLE
TM 10-1670-296-23&P	30 October 2002	Unit Manual for Ancillary Equipment for Low Velocity Air Drop Systems

PAGE NO.	COLM NO.	LINE NO.	NATIONAL STOCK NUMBER	REFERENCE NO.	FIGURE NO.	ITEM NO.	TOTAL NO. OF MAJOR ITEMS SUPPORTED	RECOMMENDED ACTION
0066 00-1					4			*Callout 16 in figure 4 is pointed to a D-Ring.In the Repair Part List key for Figure 4, item 16 is called a Snap Hook. Please correct one or the other.*

PART III – REMARKS (*Any general remarks or recommendations, or suggestions for improvement of publications and blank forms. Additional blank sheets may be used if more space is needed.)*

TYPED NAME, GRADE OR TITLE	TELEPHONE EXCHANGE/AUTOVON, PLUS EXTENSION	SIGNATURE

SAMPLE

RECOMMENDED CHANGES TO PUBLICATIONS AND BLANK FORMS For use of this form, see AR 25-30; the proponent agency is ODISC4.	Use Part II *(reverse)* for Repair Parts and Special Tool Lists (RPSTL) and Supply Catalogs/Supply Manuals (SC/SM).	DATE

TO: *(Forward to proponent of publication or form) (Include ZIP Code)* COMMANDER U.S. ARMY TACOM LIFE CYCLE MANAGEMENT COMMAND ATTN: AMSTA-LC-SECT 15 KANSAS STREET NATICK, MA 01760-5052	**FROM:** *(Activity and location) (Include ZIP Code)*

PART I – ALL PUBLICATIONS (EXCEPT RPSTL AND SC/SM) AND BLANK FORMS

PUBLICATION/FORM NUMBER	DATE	TITLE
TM 9-4520-271-14	15 August 2005	Improved Army Space Heater (IASH)

ITEM NO.	PAGE NO.	PARA-GRAPH	LINE NO. *	FIGURE NO.	TABLE NO.	RECOMMENDED CHANGES AND REASON *(Provide exact wording of recommended changes, if possible).*

**Reference to line numbers within the paragraph or subparagraph.*

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THE METRIC SYSTEM AND EQUIVALENTS

LINEAR MEASURE

1 Centimeter = 10 Millimeters = 0.01 Meters = 0.3937 Inches
1 Meter = 100 Centimeters = 1000 Millimeters = 39.37 Inches
1 Kilometer = 1000 Meters = 0.621 Miles

WEIGHTS

1 Gram = 0.001 Kilograms = 1000 Milligrams = 0.035 Ounces
1 Kilogram = 1000 Grams = 2.2 Lb.
1 Metric Ton = 1000 Kilograms = 1 Megagram = 1.1 Short Tons

LIQUID MEASURE

1 Milliliter = 0.001 Liters = 0.0338 Fluid Ounces
1 Liter = 1000 Milliliters = 33.82 Fluid Ounces

SQUARE MEASURE

1 Sq. Centimeter = 100 Sq. Millimeters = 0.155 Sq. Inches
1 Sq. Meter = 10,000 Sq. Centimeters = 10.76 Sq. Feet
1 Sq. Kilometer = 1,000,000 Sq. Meters = 0.386 Sq. Miles

CUBIC MEASURE

1 Cu. Centimeter = 1000 Cu. Millimeters = 0.06 Cu. Inches
1 Cu. Meter = 1,000,000 Cu. Centimeters = 35.31 Cu. Feet

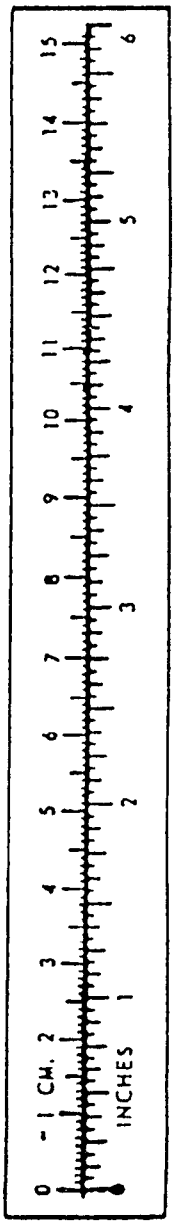
TEMPERATURE

5/9 (°F – 32) = °C
212° Fahrenheit is equivalent to 100° Celsius
90° Fahrenheit is equivalent to 32.2° Celsius
32° Fahrenheit is equivalent to 0° Celsius
9/5 (°C + 32) = °F

APPROXIMATE CONVERSION FACTORS

TO CHANGE	TO	MULTIPLY BY
Inches	Centimeters	2.540
Feet	Meters	0.305
Yards	Meters	0.914
Miles	Kilometers	1.609
Square Inches	Square Centimeters	6.451
Square Feet	Square Meters	0.093
Square Yards	Square Meters	0.836
Square Miles	Square Kilometers	2.590
Acres	Square Hectometers	0.405
Cubic Feet	Cubic Meters	0.028
Cubic Yards	Cubic Meters	0.765
Fluid Ounces	Milliliters	29.573
Pints	Liters	0.473
Quarts	Liters	0.946
Gallons	Liters	3.785
Ounces	Grams	28.349
Pounds	Kilograms	0.454
Short Tons	Metric Tons	0.907
Pound-Feet	Newton-Meters	1.356
Pounds per Square Inch	Kilopascals	6.895
Miles per Gallon	Kilometers per Liter	0.425
Miles per Hour	Kilometers per Hour	1.609

TO CHANGE	TO	MULTIPLY BY
Centimeters	Inches	0.394
Meters	Feet	3.280
Meters	Yards	1.094
Kilometers	Miles	0.621
Square Centimeters	Square Inches	0.155
Square Meters	Square Feet	10.764
Square Meters	Square Yards	1.196
Square Kilometers	Square Miles	0.386
Square Hectometers	Acres	2.471
Cubic Meters	Cubic Feet	35.315
Cubic Meters	Cubic Yards	1.308
Milliliters	Fluid Ounces	0.034
Liters	Pints	2.113
Liters	Quarts	1.057
Liters	Gallons	0.264
Grams	Ounces	0.035
Kilograms	Pounds	2.205
Metric Tons	Short Tons	1.102
Newton-Meters	Pound-Feet	0.738
Kilopascals	Pounds per Square Inch	0.145
Kilometers per Liter	Miles per Gallon	2.354
Kilometers per Hour	Miles per Hour	0.621



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